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NEWS 3 JAN 06 The retention policy for unread STNmail messages  
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NEWS 4 JAN 07 WPIDS, WPINDEX, and WPXI enhanced Japanese Patent  
Classification Data  
NEWS 5 FEB 02 Simultaneous left and right truncation (SLART) added  
for CERAB, COMPUAB, ELCOM, and SOLIDSTATE  
NEWS 6 FEB 02 GENBANK enhanced with SET PLURALS and SET SPELLING  
NEWS 7 FEB 06 Patent sequence location (PSL) data added to USGENE  
NEWS 8 FEB 10 COMPENDEX reloaded and enhanced  
NEWS 9 FEB 11 WTEXTILES reloaded and enhanced  
NEWS 10 FEB 19 New patent-examiner citations in 300,000 CA/CAPlus  
patent records provide insights into related prior  
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NEWS 12 FEB 23 Several formats for image display and print options  
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and 2009 MeSH terms  
NEWS 14 FEB 23 TOXCENTER updates mirror those of MEDLINE - more  
precise author group fields and 2009 MeSH terms  
NEWS 15 FEB 23 Three million new patent records blast AEROSPACE into  
STN patent clusters  
NEWS 16 FEB 25 USGENE enhanced with patent family and legal status  
display data from INPADOCDB  
NEWS 17 MAR 06 INPADOCDB and INPAFAMDB enhanced with new display  
formats  
NEWS 18 MAR 11 EPFULL backfile enhanced with additional full-text  
applications and grants  
NEWS 19 MAR 11 ESBIOBASE reloaded and enhanced  
NEWS 20 MAR 20 CAS databases on STN enhanced with new super role  
for nanomaterial substances  
NEWS 21 MAR 23 CA/CAPlus enhanced with more than 250,000 patent  
equivalents from China  
NEWS 22 MAR 30 IMSPATENTS reloaded and enhanced  
NEWS 23 APR 03 CAS coverage of exemplified prophetic substances  
enhanced  
NEWS 24 APR 07 STN is raising the limits on saved answers  
NEWS EXPRESS JUNE 27 08 CURRENT WINDOWS VERSION IS V8.3,  
AND CURRENT DISCOVER FILE IS DATED 23 JUNE 2008.  
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\*\*\*\*\* STN Columbus \*\*\*\*\*

FILE 'HOME' ENTERED AT 13:01:28 ON 22 APR 2009

=> file casreact  
COST IN U.S. DOLLARS  
FULL ESTIMATED COST

SINCE FILE	TOTAL
ENTRY	SESSION
0.22	0.22

FILE 'CASREACT' ENTERED AT 13:01:48 ON 22 APR 2009  
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FILE CONTENT:1840 - 19 Apr 2009 VOL 150 ISS 17

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*
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=>  
Uploading C:\Program Files\Stnexp\Queries\10577374.str

L1        STRUCTURE UPLOADED

=> d l1  
L1 HAS NO ANSWERS  
L1        STR



Structure attributes must be viewed using STN Express query preparation.

=> s l1  
SAMPLE SEARCH INITIATED 13:02:08 FILE 'CASREACT'  
SCREENING COMPLETE -        778 REACTIONS TO VERIFY FROM        84 DOCUMENTS  
100.0% DONE        778 VERIFIED        105 HIT RXNS        19 DOCS  
SEARCH TIME: 00.00.01

FULL FILE PROJECTIONS: ONLINE \*\*COMPLETE\*\*  
BATCH \*\*COMPLETE\*\*  
PROJECTED VERIFICATIONS: 13888 TO 17232  
PROJECTED ANSWERS: 119 TO 641

L2 19 SEA SSS SAM L1 ( 105 REACTIONS)

=> s l1 full

FULL SEARCH INITIATED 13:02:12 FILE 'CASREACT'  
SCREENING COMPLETE - 9335 REACTIONS TO VERIFY FROM 1553 DOCUMENTS  
100.0% DONE 9335 VERIFIED 636 HIT RXNS 247 DOCS  
SEARCH TIME: 00.00.04

L3 247 SEA SSS FUL L1 ( 636 REACTIONS)

=> file caplus

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	123.13	123.35

FILE 'CAPLUS' ENTERED AT 13:02:26 ON 22 APR 2009  
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FILE COVERS 1907 - 22 Apr 2009 VOL 150 ISS 17  
FILE LAST UPDATED: 21 Apr 2009 (20090421/ED)

Caplus now includes complete International Patent Classification (IPC) reclassification data for the third quarter of 2008.

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<http://www.cas.org/legal/infopolicy.html>

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> s l3

L4 247 L3

=> s l4 and methanol

247957 METHANOL  
L5 52 L4 AND METHANOL

=> s l5 not py > 2004

6074028 PY > 2004  
L6 31 L5 NOT PY > 2004

=> d occ 16 1-31

L6 ANSWER 1 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
FIELD COUNT  
AN 1  
IT 1

L6 ANSWER 2 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
FIELD COUNT  
AN 1  
IT 1

L6 ANSWER 3 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
FIELD COUNT  
AN 1  
IT 1

L6 ANSWER 4 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
FIELD COUNT  
AN 1  
AB 1

L6 ANSWER 5 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
FIELD COUNT  
AN 1  
ST 1  
IT 8

L6 ANSWER 6 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
FIELD COUNT  
AN 1  
IT 1

L6 ANSWER 7 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
FIELD COUNT  
AN 1  
AB 1  
IT 1

L6 ANSWER 8 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
FIELD COUNT  
AN 1  
IT 1

L6 ANSWER 9 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
FIELD COUNT  
AN 1  
TI 1  
ST 1  
IT 60

L6 ANSWER 10 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
FIELD COUNT  
AN 1  
AB 1  
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L6 ANSWER 11 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
FIELD COUNT  
AN 1  
IT 1

L6 ANSWER 12 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
FIELD COUNT

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IT	1				
L6	ANSWER 13	OF 31	CAPLUS	COPYRIGHT 2009 ACS	on STN
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IT	1				
L6	ANSWER 14	OF 31	CAPLUS	COPYRIGHT 2009 ACS	on STN
FIELD		COUNT			
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AB	2				
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ST	1				
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IT	1				
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FIELD		COUNT			
AN	1				
IT	4				
L6	ANSWER 21	OF 31	CAPLUS	COPYRIGHT 2009 ACS	on STN
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IT	1				
L6	ANSWER 22	OF 31	CAPLUS	COPYRIGHT 2009 ACS	on STN
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L6	ANSWER 23	OF 31	CAPLUS	COPYRIGHT 2009 ACS	on STN
FIELD		COUNT			
AN	1				
AB	1				
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FIELD	COUNT	
AN	1	
IT	1	
L6 ANSWER 25 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN		
FIELD	COUNT	
AN	1	
IT	2	
L6 ANSWER 26 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN		
FIELD	COUNT	
AN	1	
IT	1	
L6 ANSWER 27 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN		
FIELD	COUNT	
AN	1	
IT	2	
L6 ANSWER 28 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN		
FIELD	COUNT	
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IT	1	
L6 ANSWER 29 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN		
FIELD	COUNT	
AN	1	
TI	1	
ST	1	
IT	8	
L6 ANSWER 30 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN		
FIELD	COUNT	
AN	1	
IT	2	
L6 ANSWER 31 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN		
FIELD	COUNT	
AN	1	
IT	1	

=> d l6 ibib abs hit 1-31

L6 ANSWER 1 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 2005:396547 CAPLUS  
 DOCUMENT NUMBER: 144:369644  
 TITLE: Catalytic synthesis of dimethyl fumarate with  
 phosphotungstic acid  
 AUTHOR(S): Li, Yangshu; Yu, Bin  
 CORPORATE SOURCE: Science School, Nanjing University of Technology,  
 Nanjing, 210009, Peop. Rep. China  
 SOURCE: Huagong Shikan (2004), 18(2), 57-58  
 CODEN: HUSHT; ISSN: 1002-154X  
 PUBLISHER: Huagong Shikan Zazhishe  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese  
 OTHER SOURCE(S): CASREACT 144:369644  
 AB Phosphotungstic acid was used as an esterification catalyst for  
 synthesizing di-Me fumarate (DMF), with maleic anhydride as the starting  
 material and potassium bromate KBrO3 as the isomerizing agent. This  
 method has the advantages of requiring small amount of catalyst with high  
 catalysis activity, resulting in shorter reaction time and high DMF yield

(typically over 90%). The purification procedure of DMF is simple.  
AN 2005:396547 CAPLUS  
DN 144:369644  
IT 67-56-1, Methanol, reactions  
RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)  
(catalytic synthesis of di-Me fumarate with phosphotungstic acid)

L6 ANSWER 2 OF 31 CAPLUS COPYRIGHT 2009 ACS ON STN

ACCESSION NUMBER: 2004:626179 CAPLUS  
DOCUMENT NUMBER: 141:259007  
TITLE: Synthesis of chiral phosphoantigens and their activity in  $\gamma\delta$  T cell stimulation  
AUTHOR(S): Song, Yongcheng; Zhang, Yonghui; Wang, Hong; Raker, Amy; Sanders, John; Broderick, Erin; Clark, Allen; Morita, Craig; Oldfield, Eric  
CORPORATE SOURCE: Department of Chemistry, University of Illinois at Urbana-Champaign, Urbana, IL, 61801, USA  
SOURCE: Bioorganic & Medicinal Chemistry Letters (2004), 14(17), 4471-4477  
CODEN: BMCLE8; ISSN: 0960-894X  
PUBLISHER: Elsevier B.V.  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 141:259007

AB  $\gamma\delta$  T cells expressing Vy2V82 T cell receptors are activated by a broad range of phosphorus-containing small mols., termed phosphoantigens, and are of interest in the context of the chemotherapy of B cell malignancies. Here, we report the synthesis of four pairs of chiral phosphoantigens: the bromohydrins of isopentenyl diphosphate (PhosphostimTM), the epoxides of isopentenyl diphosphate (EIPP); and the corresponding bromohydrin and epoxide analogs of but-3-enyl diphosphate. The ability of each compound to stimulate human Vy2V82 T cells was determined by TNF- $\alpha$  release and cell proliferation. In these assays, the (R)-bromohydrin diphosphates, were, on average, about twice as active as the (S)-bromohydrin diphosphates. In contrast, the (S)-form of EIPP was about twice as active as (R)-EIPP. The activities of the epoxy but-3-enyl diphosphates were both very low. These results suggest that chiral phosphoantigens, as opposed to racemic mixts., may have utility in immunotherapy.

REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AN 2004:626179 CAPLUS  
DN 141:259007  
IT 67-56-1, Methanol, reactions 124-63-0, Methanesulfonyl chloride 2857-97-8 6236-09-5 6236-10-8 64028-90-6 69739-34-0 76282-45-6 76282-49-0 432544-59-7  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(synthesis of chiral phosphoantigens and their activity in  $\gamma\delta$  T cell stimulation)

L6 ANSWER 3 OF 31 CAPLUS COPYRIGHT 2009 ACS ON STN

ACCESSION NUMBER: 2004:557260 CAPLUS  
DOCUMENT NUMBER: 142:176440  
TITLE: Recovering of dibasic acid ester from waste alkali liquor of caprolactam preparation  
INVENTOR(S): Zhou, Xianjun; Wang, Keshun; Wu, Chonghe; Liu, Yaohong; Jiang, Ping  
PATENT ASSIGNEE(S): Zhongxinghua Industrial Co., Ltd., Peop. Rep. China  
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 19 pp.  
CODEN: CNXXEV  
DOCUMENT TYPE: Patent  
LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1401624	A	20030312	CN 2001-124260	20010820
CN 1172898	C	20041027		

PRIORITY APPLN. INFO.: CN 2001-124260 20010820  
OTHER SOURCE(S): CASREACT 142:176440  
AB The recovering method comprises: (1) neutralizing the waste alkali liquor of caprolactam preparation to sep. aqueous phase and organic phase and oxidizing the organic substance in the organic phase with an oxidant selected from HNO<sub>3</sub>, H<sub>2</sub>O<sub>2</sub>, HClO<sub>4</sub>, or KMnO<sub>4</sub>, (2) transferring the reaction product of the dibasic acid into a two-segments concentration unit to recover monobasic acid and HNO<sub>3</sub> in the first segment and decompose the residual HNO<sub>3</sub> and nitro compound in the second segment to obtain crude C4-6 dibasic acid, (3) esterifying with C1-4 alc. in the presence of catalyst, such as H<sub>2</sub>SO<sub>4</sub>, H<sub>3</sub>PO<sub>4</sub>, HNO<sub>3</sub>, sulfonic acid, and cationic exchange resin, and distilling  
AN 2004:557260 CAPLUS  
DN 142:176440  
IT 67-56-1, Methanol, reactions 7664-38-2, Phosphoric acid, reactions 7697-37-2, Nitric acid, reactions 7722-64-7, Potassium permanganate 7722-84-1, Hydrogen peroxide, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(recovering of dibasic acid ester from waste alkali liquor of caprolactam preparation)

L6 ANSWER 4 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2004:163065 CAPLUS  
DOCUMENT NUMBER: 141:54226  
TITLE: Synthesis of 2-(5-methyl-2-phenyl-4-oxazolyl)ethanol  
AUTHOR(S): Wang, Ya-Lou; Liu, Xing; Li, Jiang-Chuan  
CORPORATE SOURCE: Department of Medicinal Chemistry, China Pharmaceutical University, Nanjing, 210009, Peop. Rep. China  
SOURCE: Yingyong Huaxue (2004), 21(1), 104-106  
CODEN: YIHUED; ISSN: 1000-0518  
PUBLISHER: Kexue Chubanshe  
DOCUMENT TYPE: Journal  
LANGUAGE: Chinese  
OTHER SOURCE(S): CASREACT 141:54226  
AB 2-(5-Methyl-2-phenyl-4-oxazolyl)ethanol (I) was synthesized from L-aspartic acid via 5-step reactions; esterification, N-benzoylation, Dakin-West reaction, cyclization and reduction using LiAlH<sub>4</sub> in about 31.2% overall yield. Reacting L-aspartic acid with methanol in 0 °C gave 72.6% L-aspartic acid β-Me ester hydrochloride, which was benzoylated to give 82.0% N-benzoyl-L-aspartic acid β-Me ester (II). Dakin-West reaction of II gave 74.4% Me 3-benzamido-4-oxovalerate, which was cyclized in toluene by POCl<sub>3</sub> to give 81.8% Me 2-(5-methyl-2-phenyl-4-oxazolyl)acetate, the latter can easily convert to I by treatment with ether solution of LiAlH<sub>4</sub> in yield of 86%. All the compds. were characterized by <sup>1</sup>H NMR, IR and elemental anal.  
AN 2004:163065 CAPLUS  
DN 141:54226  
AB 2-(5-Methyl-2-phenyl-4-oxazolyl)ethanol (I) was synthesized from L-aspartic acid via 5-step reactions; esterification, N-benzoylation, Dakin-West reaction, cyclization and reduction using LiAlH<sub>4</sub> in about 31.2% overall yield. Reacting L-aspartic acid with methanol in 0 °C gave 72.6% L-aspartic acid β-Me ester hydrochloride, which was benzoylated to give 82.0% N-benzoyl-L-aspartic acid β-Me ester



(II). Dakin-West reaction of II gave 74.4% Me 3-benzamido-4-oxovalerate, which was cyclized in toluene by POCl<sub>3</sub> to give 81.8% Me 2-(5-methyl-2-phenyl-4-oxazolyl)acetate, the latter can easily convert to I by treatment with ether solution of LiAlH<sub>4</sub> in yield of 86%. All the compds. were characterized by <sup>1</sup>H NMR, IR and elemental anal.

L6 ANSWER 5 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2003:954590 CAPLUS

DOCUMENT NUMBER: 141:191003

TITLE: Reactions of 2H-3,1-benzoxazine -2,4(1H)-dione

AUTHOR(S): Milea, M.; Csunderlik, C.; Fota, Daniela

CORPORATE SOURCE: Department of Organic Chemistry, The University "POLITEHNICA" Timisoara, Timisoara, RO-1900, Rom. Buletinul Stiintific al Universitatii "Politehnica" din Timisoara Romania, Seria Chimie si Mediului (2000), 45(1), 163-167

CODEN: BSIMFG; ISSN: 1224-6018

PUBLISHER: Universitatii "Politehnica" din Timisoara

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 141:191003

AB Reactions of isatoic anhydride (2H-3,1-benzoxazine -2,4(1H)-dione) with alcs. and phenols, both in the presence or absence of basic catalysts, have been studied, conditions have been established and the products characterized by physico-chemical methods. Also the reactions of isatoic anhydride with Me esters of  $\alpha$ -amino acids were studied among the reactions of isatoic anhydride with nitrogen nucleophiles.

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AN 2003:954590 CAPLUS

DN 141:191003

ST isatoic anhydride benzoxazinedione reaction alc phenol; amino acid ester nucleophile prepn esterification methanol benzoxazinedione reaction

IT Amino acids, preparation

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(esters; prepn of Me esters of amino acids by esterification of amino acids with methanol)

IT Esterification

(prepn of Me esters of amino acids by esterification of amino acids with methanol)

IT 67-56-1, Methanol, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)  
(prepn of Me esters of amino acids by esterification of amino acids with methanol)

IT 5680-79-5P 6384-18-5P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(prepn of Me esters of amino acids by esterification of amino acids with methanol)

IT 2491-18-1P 7517-19-3P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(prepn of Me esters of amino acids by esterification of amino acids with methanol)

L6 ANSWER 6 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2003:363327 CAPLUS

DOCUMENT NUMBER: 139:230335

TITLE: Base-induced alcoholysis of N-arylmaleimides: facile in situ oxa-michael addition to alkyl maleanilates: Two-step one-pot rapid access to alkoxy-succinic acids

AUTHOR(S): Mhaske, Santosh B.; Argade, Narshinha P.

CORPORATE SOURCE: Division of Organic Chemistry (Synthesis), National  
Chemical Laboratory, Pune, 411 008, India  
SOURCE: Synthesis (2003), (6), 863-870  
CODEN: SYNTBF; ISSN: 0039-7881

PUBLISHER: Georg Thieme Verlag  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 139:230335

AB A simple, efficient and general two-step, one-pot approach to  
alkoxysuccinic acids is described. The potassium carbonate-catalyzed  
reactions of alcs. with 1-(4-methylphenyl)-1H-pyrrole-2,5-dione followed  
by an acid-induced hydrolysis of intermediate products furnished  
alkoxysuccinic acids in 90-98% yields. All the intermediates from the  
reaction of 1-(4-Methylphenyl)-1H-Pyrrole-2,5-dione were characterized,  
proving that the in situ formed alkyl maleanilates are the actual Michael  
acceptors.

REFERENCE COUNT: 61 THERE ARE 61 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AN 2003:363327 CAPLUS  
DN 139:230335

IT 64-17-5, Ethanol, reactions 67-56-1, Methanol, reactions  
67-63-0, 2-Propanol, reactions 71-41-0, 1-Pentanol, reactions  
100-51-6, Benzenemethanol, reactions 107-21-1, 1,2-Ethanediol, reactions  
108-31-6, Maleic anhydride, reactions 111-87-5, 1-Octanol, reactions  
112-30-1, 1-Decanol 112-53-8, 1-Dodecanol 3886-69-9,  
( $\alpha$ R)- $\alpha$ -Methylbenzenemethanamine 24870-11-9,  
(2Z)-4-[(4-Methylphenyl)amino]-4-oxo-2-butenic acid  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(two-step one-pot preparation of (alkoxy)succinic acids via base-induced  
alcoholysis of N-arylmaleimides and facile in situ oxa-Michael addition to  
alkyl maleanilates)

L6 ANSWER 7 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2003:44804 CAPLUS

DOCUMENT NUMBER: 138:337689

TITLE: Synthesis of dimethyl fumarate by heterogeneous  
supported heteropoly acid

AUTHOR(S): Xu, Wenyuan; Peng, Daofeng; Xiong, Guoxuan; Zhu,  
Xiaping

CORPORATE SOURCE: Department of Applied Chemistry, East China Institute  
of Technology, Fuzhou, 344000, Peop. Rep. China

SOURCE: Huaxue Shiji (2002), 24(6), 367-368  
CODEN: HUSHDR; ISSN: 0258-3283

PUBLISHER: Huagongbu Huaxue Shiji Xinsizhan

DOCUMENT TYPE: Journal

LANGUAGE: Chinese

OTHER SOURCE(S): CASREACT 138:337689

AB Synthesis of di-Me fumarate by esterification reaction of fumaric acid  
with methanol catalyzed by heterogeneous supported heteropoly  
acid PW12/C was studied in this paper. A careful study of the effects on  
the esterification reaction was done. Under these conditions, the yield  
of ester was about 91.6%.

AN 2003:44804 CAPLUS

DN 138:337689

AB Synthesis of di-Me fumarate by esterification reaction of fumaric acid  
with methanol catalyzed by heterogeneous supported heteropoly  
acid PW12/C was studied in this paper. A careful study of the effects on  
the esterification reaction was done. Under these conditions, the yield  
of ester was about 91.6%.

IT 67-56-1, Methanol, reactions 110-17-8, Fumaric acid, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(synthesis of di-Me fumarate by heterogeneous supported heteropoly  
acid)

L6 ANSWER 8 OF 31 CAPLUS COPYRIGHT 2009 ACS ON STN

ACCESSION NUMBER: 2002:952405 CAPLUS

DOCUMENT NUMBER: 139:6591

TITLE: Catalytic synthesis of dimethyl fumarate using solid-supported superacid catalyst

AUTHOR(S): Zhao, Lifang; He, Zhusheng; Ma, Yuying

CORPORATE SOURCE: Dept. Chem. + Chem. Eng., Baoji Coll. Arts + Sci., Baoji, 721007, Peop. Rep. China

SOURCE: Baoji Wenli Xueyuan Xuebao, Ziran Kexueban (2002), 22(2), 138-140

CODEN: BWZKFL

PUBLISHER: Baoji Wenli Xueyuan Xuebao Bianjibu

DOCUMENT TYPE: Journal

LANGUAGE: Chinese

OTHER SOURCE(S): CASREACT 139:6591

AB The preparation of supported catalyst, TiO<sub>2</sub>/La<sub>3</sub>+SO<sub>4</sub><sup>2-</sup> supported on mol. sieves, and its catalytic activity to esterification of fumarate were studied. The catalyst had fine catalytic activity. The optimum conditions of the esterification were decided by orthogonal expts. as follows: activation temperature of the catalyst was 500°, the amount of catalyst was 15% (based on the mass of fumaric acid), the mole ratio of alc. to acid was 6:1 and the reaction time was 5 h. Under the optimum reaction conditions, the yield of di-Me fumarate was up to 92.3%.

AN 2002:952405 CAPLUS

DN 139:6591

IT 67-56-1, Methanol, reactions 110-17-8, Fumaric acid, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(synthesis of di-Me fumarate using solid-supported superacid catalyst)

L6 ANSWER 9 OF 31 CAPLUS COPYRIGHT 2009 ACS ON STN

ACCESSION NUMBER: 2002:903288 CAPLUS

DOCUMENT NUMBER: 138:271016

TITLE: A simple, convenient and expeditious route to methyl esters of carboxylic acids by thionyl chloride-methanol

AUTHOR(S): Chatterjee, Tapasi; Chattopadhyay, Subhagata

CORPORATE SOURCE: Department of Chemistry, Jadavpur University, Kolkata, 700 032, India

SOURCE: Oriental Journal of Chemistry (2002), 18(2), 187-190

CODEN: OJCHEG; ISSN: 0970-020X

PUBLISHER: Oriental Scientific Publishing Co.

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 138:271016

AB A simple, convenient and expeditious preparation of 40-90% Me esters of carboxylic acids by thionyl chloride and MeOH was described. Among the 29 esters prepared were 90% 2-IC<sub>6</sub>H<sub>4</sub>CO<sub>2</sub>Me, 87% 4-MeOC<sub>6</sub>H<sub>4</sub>CO<sub>2</sub>Me and 86% Bz(CH<sub>2</sub>)<sub>2</sub>CO<sub>2</sub>Me.

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AN 2002:903288 CAPLUS

DN 138:271016

TI A simple, convenient and expeditious route to methyl esters of carboxylic acids by thionyl chloride-methanol

ST thionyl chloride methanol esterification carboxylic acid

IT Esterification

(preparation of Me esters of carboxylic acids by thionyl chloride-methanol)

IT Esters, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)

(preparation of Me esters of carboxylic acids by thionyl chloride-methanol)

IT 62-23-7, 4-Nitrobenzoic acid 65-85-0, Benzoic acid, reactions 69-72-7, 2-Hydroxybenzoic acid, reactions 79-11-8, Chloroacetic acid, reactions 87-69-4, L-Tartaric acid, reactions 88-67-5, 2-Iodobenzoic acid 88-99-3, Phthalic acid, reactions 99-06-9, 3-Hydroxybenzoic acid, reactions 99-34-3, 3,5-Dinitrobenzoic acid 99-96-7, 4-Hydroxybenzoic acid, reactions 100-09-4, 4-Methoxybenzoic acid 103-82-2, Phenylacetic acid, reactions 110-15-6, Succinic acid, reactions 110-16-7, Maleic acid, reactions 110-17-8, Fumaric acid, reactions 110-44-1, 2,4-Hexadienoic acid 117-34-0, Diphenylacetic acid 118-91-2, 2-Chlorobenzoic acid 121-92-6, 3-Nitrobenzoic acid 140-10-3, trans-Cinnamic acid, reactions 141-82-2, Malonic acid, reactions 144-62-7, Oxalic acid, reactions 527-72-0, 2-Thiophenecarboxylic acid 552-16-9, 2-Nitrobenzoic acid 2051-95-8, 3-Phenylpropionic acid  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (preparation of Me esters of carboxylic acids by thionyl chloride-methanol)

IT 64-17-5, Ethanol, reactions 67-56-1, Methanol, reactions 67-63-0, Isopropanol, reactions 7719-09-7, Thionyl chloride  
 RL: RGT (Reagent); RACT (Reactant or reagent)  
 (preparation of Me esters of carboxylic acids by thionyl chloride-methanol)

IT 93-58-3P, Methyl benzoate 93-89-0P, Ethyl benzoate 96-34-4P, Methyl chloroacetate 99-76-3P, Methyl 4-hydroxybenzoate 99-77-4P, Ethyl 2-nitrobenzoate 101-41-7P, Methyl phenylacetate 106-65-0P, Dimethyl succinate 108-59-8P, Dimethyl malonate 119-36-8P, Methyl 2-hydroxybenzoate 121-98-2P, Methyl 4-methoxybenzoate 131-11-3P, Dimethyl phthalate 553-90-2P, Dimethyl oxalate 606-27-9P, Methyl 2-nitrobenzoate 608-68-4P 610-96-8P, Methyl 2-chlorobenzoate 610-97-9P, Methyl 2-iodobenzoate 618-95-1P, Methyl 3-nitrobenzoate 619-50-1P, Methyl 4-nitrobenzoate 624-49-7P, Dimethyl fumarate 689-89-4P 939-48-0P, Isopropyl benzoate 1754-62-7P 2702-58-1P, Methyl 3,5-dinitrobenzoate 3469-00-9P, Methyl diphenylacetate 5380-42-7P, Methyl 2-thiophenecarboxylate 13756-40-6P, Isopropyl 2-nitrobenzoate 19438-10-9P, Methyl 3-hydroxybenzoate 25333-24-8P, Methyl 3-benzoylpropionate  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation of Me esters of carboxylic acids by thionyl chloride-methanol)

L6 ANSWER 10 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2002:81290 CAPLUS  
 DOCUMENT NUMBER: 137:352688  
 TITLE: Catalytic reaction-distillation synthesis of dimethyl fumarate by fixed-carried heteropoly acid  
 AUTHOR(S): Ding, Bin; Guo, Xiangming  
 CORPORATE SOURCE: Jilin Institute of Chemical Technology, Jilin, 1320022, Peop. Rep. China  
 SOURCE: Dongbei Shida Xuebao, Ziran Kexueban (2001), 33(4), 61-65  
 CODEN: DSZKEE; ISSN: 1000-1832  
 PUBLISHER: Dongbei Shifan Daxue Xueshu Qikanshe  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese  
 OTHER SOURCE(S): CASREACT 137:352688

AB A new synthesis technol. of di-Me fumarate was presented. Fumarate, methanol, and self-made fixed-carried heteropoly acid as catalyst were used. The reaction-distillation conditions were ratio of alc. and acid about 7:1; esterification temperature about 67-78°; and reaction time ≤6 h. The yield of product was up to 92%.

AN 2002:81290 CAPLUS  
 DN 137:352688

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were used. The reaction-distillation conditions were ratio of alc. and acid about 7:1; esterification temperature about 67-78°; and reaction time ≤6 h. The yield of product was up to 92%.

IT 67-56-1, Methanol, reactions 110-17-8, Fumaric acid, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(catalytic reaction-distillation synthesis of di-Me fumarate by  
fixed-carried  
heteropoly acid)

L6 ANSWER 11 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:537078 CAPLUS

DOCUMENT NUMBER: 135:256190

TITLE: Lipase-catalyzed synthesis of RGD diamide in aqueous water-miscible organic solvents

AUTHOR(S): Zhang, L.-Q.; Zhang, Y.-D.; Xu, L.; Li, X.-L.; Yang, X.-c.; Xu, G.-L.; Wu, X.-X.; Gao, H.-Y.; Du, W.-B.; Zhang, X.-T.; Zhang, X.-Z.

CORPORATE SOURCE: Key Laboratory of Molecular Enzymology and Engineering, Jilin University, Changchun, 130023, Peop. Rep. China

SOURCE: Enzyme and Microbial Technology (2001), 29(2-3), 129-135

CODEN: EMTED2; ISSN: 0141-0229

PUBLISHER: Elsevier Science Ireland Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 135:256190

AB 1RGD tripeptide as the cellular adhesion factor was synthesized by a combination of chemical and enzymic methods in this study. First of all, Gly-Asp diamide was synthesized by a novel chemical method in three steps including preparation of L-aspartic acid di-Me ester, chloroacetylation of L-aspartic acid di-Me ester and ammonolysis of chloroacetyl L-aspartic acid di-Me ester. Secondly, Porcine Pancreas Lipase (PPL) was used to catalyze the synthesis of Benzyl-Arg-Gly-Asp diamide in water-organic cosolvents systems. The reaction condition was optimized by examining the main factors affecting the yield of the tripeptide. The optimal reaction condition was set up as pH7.7, 15°C in 50% DMF for 8 h with the maximum yield of 76.4%. It was also found that 50% DMSO was another alternative with the tripeptide yield of 71.7%.

REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AN 2001:537078 CAPLUS

DN 135:256190

IT 56-84-8, L-Aspartic acid, reactions 67-56-1, Methanol, reactions 79-04-9, Chloroacetyl chloride 1336-21-6, Ammonium hydroxide 7664-41-7, Ammonia, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(lipase-catalyzed synthesis of RGD diamide in aqueous water-miscible organic solvents)

L6 ANSWER 12 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:535025 CAPLUS

DOCUMENT NUMBER: 136:294520

TITLE: Synthesis of dimethyl fumarate catalyzed by SO42-/TiO2/La3+ rare earth solid superacid

AUTHOR(S): Zhou, Jianwei

CORPORATE SOURCE: Department of Chemical Engineering, Pingyuan University, Xinxiang, 453003, Peop. Rep. China

SOURCE: Henan Huagong (2001), (5), 12-14

CODEN: HEHUF3; ISSN: 1003-3467

PUBLISHER: Henansheng Shiyou Huaxue Gongye Keji Qingbao

DOCUMENT TYPE: Zhongxinzhan

Journal

LANGUAGE: Chinese  
OTHER SOURCE(S): CASREACT 136:294520

AB Di-Me fumarate was synthesized from fumaric acid and methanol with SO42-/TiO2/La3+ rare earth solid superacid as catalyst in dichloromethane solvent. Optimum synthetic conditions were determined: molar ratio of fumaric acid to methanol 6:1, dosage of catalyst 1.0 g/0.1 mol fumaric acid, time 4 h and solvent 25 mL. Yield of product reached above 94%.

AN 2001:535025 CAPLUS

DN 136:294520

AB Di-Me fumarate was synthesized from fumaric acid and methanol with SO42-/TiO2/La3+ rare earth solid superacid as catalyst in dichloromethane solvent. Optimum synthetic conditions were determined: molar ratio of fumaric acid to methanol 6:1, dosage of catalyst 1.0 g/0.1 mol fumaric acid, time 4 h and solvent 25 mL. Yield of product reached above 94%.

ST dimethyl fumarate synthesis fumaric acid methanol solid superacid catalysis

IT 67-56-1, Methanol, reactions 110-17-8, Fumaric acid, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(synthesis of di-Me fumarate catalyzed by SO42-/TiO2/La3+ rare earth solid superacid)

L6 ANSWER 13 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:461290 CAPLUS

DOCUMENT NUMBER: 136:279092

TITLE: Synthesis of dimethyl fumarate from maleic acid

AUTHOR(S): Cao, Kelin

CORPORATE SOURCE: Shanxi Taiming Chemical Engineering Co., Ltd., Taigu, 030800, Peop. Rep. China

SOURCE: Huagong Jinzhan (2001), 20(4), 33-34, 39

CODEN: HUJIEK; ISSN: 1000-6613

PUBLISHER: Huaxue Gongye Chubanshe

DOCUMENT TYPE: Journal

LANGUAGE: Chinese

OTHER SOURCE(S): CASREACT 136:279092

AB Title compound was prepared from maleic acid, isomerized fumaric acid in the presence of ammonium persulfate as catalyst, further esterification with methanol in the presence of phosphotungstic acid as catalyst, giving product with yield over 94%. The effects of catalysts and catalyst amount on the reactions were studied.

AN 2001:461290 CAPLUS

DN 136:279092

AB Title compound was prepared from maleic acid, isomerized fumaric acid in the presence of ammonium persulfate as catalyst, further esterification with methanol in the presence of phosphotungstic acid as catalyst, giving product with yield over 94%. The effects of catalysts and catalyst amount on the reactions were studied.

IT 67-56-1, Methanol, reactions 110-16-7, Maleic acid, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(synthesis of di-Me fumarate from maleic acid)

L6 ANSWER 14 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2001:443163 CAPLUS

DOCUMENT NUMBER: 136:263409

TITLE: Synthesis of new chiral lipophilic macrocyclic oxo polyamines

AUTHOR(S): Yan, Qianshun; You, Jinsong; Xiang, Qingxiang; Yu, Xiaoqi; Xie, Rugang

CORPORATE SOURCE: Department of Chemistry, Sichuan University, Chengdu, 610064, Peop. Rep. China

SOURCE: Huaxue Yanjiu Yu Yingyong (2001), 13(2), 189-191

CODEN: HYYIFM; ISSN: 1004-1656

PUBLISHER: Huaxue Yanjiu Yu Yingyong Bianjibu  
DOCUMENT TYPE: Journal  
LANGUAGE: Chinese  
OTHER SOURCE(S): CASREACT 136:263409

AB New chiral lipophilic macrocyclic oxo polyamines were synthesized from L-glutamic acid or L-aspartic acid by esterifying with methanol, acylating with dodecanoyl chloride in chloroform in the presence of K<sub>2</sub>CO<sub>3</sub> to obtain di-Me N-dodecanoyl-L-glutamate or L-aspartate, and transacylating with diethylenetriamine or triethylenetetraamine in methanol under refluxing. Their structures were characterized by MS, <sup>1</sup>H NMR, and elemental anal.

AN 2001:443163 CAPLUS

DN 136:263409

AB New chiral lipophilic macrocyclic oxo polyamines were synthesized from L-glutamic acid or L-aspartic acid by esterifying with methanol, acylating with dodecanoyl chloride in chloroform in the presence of K<sub>2</sub>CO<sub>3</sub> to obtain di-Me N-dodecanoyl-L-glutamate or L-aspartate, and transacylating with diethylenetriamine or triethylenetetraamine in methanol under refluxing. Their structures were characterized by MS, <sup>1</sup>H NMR, and elemental anal.

L6 ANSWER 15 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2000:832322 CAPLUS

DOCUMENT NUMBER: 134:310893

TITLE: Synthesis of dimethyl fumarate catalyzed by composite solid superacid SO<sub>4</sub><sup>2-</sup>/TiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub>

AUTHOR(S): Cheng, Yonghao

CORPORATE SOURCE: Department of Chemistry, Hebei Normal University, Shijiazhuang, 050016, Peop. Rep. China

SOURCE: Riyong Huaxue Gongye (2000), 30(5), 12-13

CODEN: RHGOE8; ISSN: 1001-1803

PUBLISHER: Qinggongyebu Kexue Jishu Qingbao Yanjiuso

DOCUMENT TYPE: Journal

LANGUAGE: Chinese

OTHER SOURCE(S): CASREACT 134:310893

AB Di-Me fumarate was synthesized from fumaric acid and methanol with composite solid superacid SO<sub>4</sub><sup>2-</sup>/TiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub> as catalyst. Optimum synthetic conditions were determined: methanol:fumaric acid 6:1, time 4 h, and dosage of catalyst 3 g. Yield of product reached 91.4%.

AN 2000:832322 CAPLUS

DN 134:310893

AB Di-Me fumarate was synthesized from fumaric acid and methanol with composite solid superacid SO<sub>4</sub><sup>2-</sup>/TiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub> as catalyst. Optimum synthetic conditions were determined: methanol:fumaric acid 6:1, time 4 h, and dosage of catalyst 3 g. Yield of product reached 91.4%.

IT 67-56-1, Methanol, reactions 110-17-8, Fumaric acid, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(synthesis of di-Me fumarate catalyzed by composite solid superacid SO<sub>4</sub><sup>2-</sup>/TiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub>)

L6 ANSWER 16 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2000:586307 CAPLUS

DOCUMENT NUMBER: 133:296252

TITLE: A simple method for the preparation of monomethyl esters of dicarboxylic acids by selective esterification of the nonconjugated carboxyl group in the presence of an aromatic or conjugated carboxyl group

AUTHOR(S): Ram, Ram N.; Meher, Nabin Kumar

CORPORATE SOURCE: Department of Chemistry, Indian Institute of Technology, New Delhi, 110016, India

SOURCE: Journal of Chemical Research, Synopses (2000), (6), 282-283

CODEN: JRPSDC; ISSN: 0308-2342

PUBLISHER: Science Reviews Ltd.  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 133:296252

AB Various dicarboxylic acids were converted selectively into monomethyl esters in which the nonconjugated carboxyl group is selectively esterified in the presence of an aromatic or conjugated carboxyl group at room temperature (.apprx.25-27°) in MeOH using a catalytic amount of SOCl<sub>2</sub>.

REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AN 2000:586307 CAPLUS  
DN 133:296252  
ST dicarboxylate methanol selective esterification; ester dicarboxylic selective prepn

L6 ANSWER 17 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
ACCESSION NUMBER: 1998:732350 CAPLUS  
DOCUMENT NUMBER: 130:66049  
TITLE: A selective method for the preparation of aliphatic methyl esters in the presence of aromatic carboxylic acids

AUTHOR(S): Rodriguez, A.; Nomen, M.; Spur, B. W.  
CORPORATE SOURCE: Department of Cell Biology, Univ. of Medicine and Dentistry of New Jersey, Stratford, NJ, 08084, USA  
SOURCE: Tetrahedron Letters (1998), 39(47), 8563-8566  
CODEN: TELEAY; ISSN: 0040-4039

PUBLISHER: Elsevier Science Ltd.  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 130:66049

AB 2,2-Dimethoxypropane, methanol and a catalytic amount of HCl selectively esterify aliphatic carboxylic acids in the presence of aromatic carboxylic acids at room temperature and in high yields.

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AN 1998:732350 CAPLUS  
DN 130:66049  
AB 2,2-Dimethoxypropane, methanol and a catalytic amount of HCl selectively esterify aliphatic carboxylic acids in the presence of aromatic carboxylic acids at room temperature and in high yields.

L6 ANSWER 18 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
ACCESSION NUMBER: 1994:680006 CAPLUS  
DOCUMENT NUMBER: 121:280006  
ORIGINAL REFERENCE NO.: 121:51115a, 51118a  
TITLE: A convenient and mild procedure for the preparation of hydroxy esters from lactones and hydroxy acids

AUTHOR(S): Anand, R. C.; Selvapalam, N.  
CORPORATE SOURCE: Dep. Chem., Indian Inst. Technol., New Delhi, 110016, India

SOURCE: Synthetic Communications (1994), 24(19), 2743-7  
CODEN: SYNCAV; ISSN: 0039-7911

DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 121:280006

AB An alc. solution of lactones and hydroxy acids stored on Amberlyst-15 results in the formation of corresponding hydroxy esters in high yields.

AN 1994:680006 CAPLUS  
DN 121:280006  
OREF 121:51115a, 51118a

IT 64-17-5, Ethanol, reactions 67-56-1, Methanol, reactions 79-14-1, reactions 87-41-2, 1(3H)-Isobenzofuranone 87-69-4, reactions



96-48-0 119-84-6 502-44-3, 2-Oxepanone 542-28-9 553-86-6,  
 2(3H)-Benzofuranone 828-01-3 4026-18-0  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (mild procedure for the preparation of hydroxy esters from lactones and  
 hydroxy acids)

L6 ANSWER 19 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1994:269626 CAPLUS  
 DOCUMENT NUMBER: 120:269626  
 ORIGINAL REFERENCE NO.: 120:47747a,47750a  
 TITLE: Catalytic synthesis of dimethyl fumarate with ferric  
 chloride  
 AUTHOR(S): Yu, Shanxin; Lei, Huanwen  
 CORPORATE SOURCE: Dep. Chem., Hunan Norm. Univ., Changsha, 410081, Peop.  
 Rep. China  
 SOURCE: Huaxue Shiji (1993), 15(6), 374, 376  
 CODEN: HUSHDR; ISSN: 0258-3283  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese  
 OTHER SOURCE(S): CASREACT 120:269626  
 AB Ferric chloride (FeCl<sub>3</sub>·6H<sub>2</sub>O) can be used as a catalyst for the  
 esterification reaction of fumaric acid instead of sulfuric acid. The  
 conditions in synthesis of di-Me fumarate catalyzed with FeCl<sub>3</sub>·6H<sub>2</sub>O  
 are described. The advantages of this method are: simple procedure, mild  
 reaction conditions, non-corrosive, less pollution and purer product.  
 AN 1994:269626 CAPLUS  
 DN 120:269626  
 OREF 120:47747a,47750a  
 IT Esterification catalysts  
 (ferric chloride, for fumaric acid with methanol)

L6 ANSWER 20 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1993:626419 CAPLUS  
 DOCUMENT NUMBER: 119:226419  
 ORIGINAL REFERENCE NO.: 119:40439a,40442a  
 TITLE: Method for preparing amino acid esters involving  
 (continuous) addition and distillation of alcohols  
 Takemoto, Tadashi; Takeda, Hideo  
 INVENTOR(S): Ajinomoto Co., Inc., Japan  
 PATENT ASSIGNEE(S): Eur. Pat. Appl., 4 pp.  
 SOURCE: CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 544205	A2	19930602	EP 1992-119898	19921123
EP 544205	A3	19930728		
EP 544205	B1	19950906		
R: BE, CH, DE, FR, GB, IT, LI, NL				
JP 05148199	A	19930615	JP 1991-314585	19911128
CA 2084012	A1	19930529	CA 1992-2084012	19921127
US 5424476	A	19950613	US 1994-194635	19940210
PRIORITY APPLN. INFO.:			JP 1991-314585	A 19911128
			US 1992-982123	B1 19921125

OTHER SOURCE(S): CASREACT 119:226419  
 AB Amino acid esters were prepared by heating a mixture of an amino acid, an  
 alc., and H<sub>2</sub>SO<sub>4</sub> with simultaneous addition of liquid or gaseous alc. to the  
 reaction mixture and distillation of the same. Thus, H-Phe-OH in MeOH  
 containing cat.  
 H<sub>2</sub>SO<sub>4</sub> was kept at 85° for 4 h with simultaneous addition and distillation of

MeOH to give 98.6% H-Phe-OMe. Simple reflux of the above reactants gave a yield of only 83-2% product.

AN 1993:626419 CAPLUS

DN 119:226419

OREF 119:40439a,40442a

IT 56-41-7P, L-Alanine, reactions 56-84-8P, H-Asp-OH, reactions 63-91-2P, L-Phenylalanine, reactions 72-18-4P, L-Valine, reactions

RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(esterification of, with methanol, continuous distillation and addition of alc. in)

L6 ANSWER 21 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1993:580649 CAPLUS

DOCUMENT NUMBER: 119:180649

ORIGINAL REFERENCE NO.: 119:32287a,32290a

TITLE: Preparation of pyrrolidine derivatives from amino acids.

INVENTOR(S): Hirabayashi, Satoshi; Ike, Kazuo; Zanka, Atuhiko; Kawakami, Takeshi; Ichihara, Masaharu

PATENT ASSIGNEE(S): Fujisawa Pharmaceutical Co., Ltd., Japan

SOURCE: PCT Int. Appl., 20 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

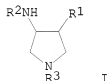
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9220652	A1	19921126	WO 1992-JP648	19920520
W: JP, US				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, MC, NL, SE				
JP 04346971	A	19921202	JP 1991-219431	19910521
PRIORITY APPLN. INFO.:			JP 1991-219431	A 19910521
OTHER SOURCE(S):	CASREACT	119:180649; MARPAT	119:180649	

GI



AB Reaction of R2-NH-CH(CO2-R5)-CH2-CO2-R4 (R2, R4, R5 = protecting group) with R1-X [R1 = alkyl; X = leaving group] gives R2-NH-CH(CO2-R5)-CH(R1)-CO2-R4, whose reduction gives R2-NH-CH(CH2OH)-CH(R1)-CH2OH, whose condensation with H2N-R3 (R3 = protecting group) gives pyrrolidine derivs. I, which are optionally deprotected. Di-Me (S)-aspartate hydrochloride (preparation given) in CH2Cl2 was mixed with a saturated aqueous solution of NaHCO3, tert-di-Bu dicarbonate was

added, and the resulting mixture was allowed to stand overnight to give di-Me (S)-N-tert-butoxycarbonylaspartate, which was treated with MeI in THF containing hexamethyldisilazane and BuLi at -40 to -30° for 2 h to give, after adjusting to pH 7-8 with 1N HCl, a 1:1 mixture of threo- and erythro-(2S)-N-(tert-butoxycarbonyl)-3-methylaspartic acid di-Me ester, which was reduced with NaBH4 in THF-MeOH at 35-50° for 4 h to give a diastereomeric mixture of (2S)-N-(tert-butoxycarbonylamino)-3-methyl-1,4-butanediol, whose dimesylate ester was heated with benzylamine at

30-50° for 3 days to give 74% a diastereomeric mixture of 1-benzyl-3-tert-butoxycarbonylamino-4-methylpyrrolidine. (3S,4S)-1-benzyl-3-tert-butoxycarbonylamino-4-methylpyrrolidine in MeOH-H<sub>2</sub>O containing HCO<sub>2</sub>NH<sub>4</sub> was hydrogenolyzed over Pd/C to give (3S,4S)-3-tert-butoxycarbonylamino-4-methylpyrrolidine, which in MeOH-EtOAc was treated with HCl in EtOAc at room temperature for 2 h and then

at

35° for 2 h to give (3S,4S)-3-amino-4-methylpyrrolidine.

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

AN 1993:580649 CAPLUS

DN 119:180649

OREF 119:32287a,32290a

IT 56-84-8, (S)-Aspartic acid, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)  
(esterification of, with methanol)

L6 ANSWER 22 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1992:612978 CAPLUS

DOCUMENT NUMBER: 117:212978

ORIGINAL REFERENCE NO.: 117:36823a,36826a

TITLE: Process for preparing diketopiperazine derivatives

INVENTOR(S): Toshihisa, Kato; Tadashi, Takemoto

PATENT ASSIGNEE(S): Ajinomoto Co., Inc., Japan

SOURCE: Eur. Pat. Appl., 5 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

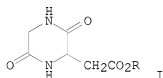
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 493812	A1	19920708	EP 1991-122307	19911227
R: BE, DE, FR, JP 04234374	GB, NL			
	A	19920824	JP 1990-418592	19901227
			JP 1990-418592	A 19901227

PRIORITY APPLN. INFO.:

OTHER SOURCE(S): CASREACT 117:212978; MARPAT 117:212978

GI



AB Diketopiperazines I (R = C1-6-alkyl) were prepared by treating (chloroacetyl)aspartic acid with NH<sub>3</sub>, esterifying the resulting H-Gly-Asp-OH with an alkanol, and cyclizing the resulting diester neutral or weakly basic water or in an alkanol-water solvent mixture. Thus, L-aspartic acid was acylated with ClCH<sub>2</sub>COCl in aqueous NaOH to give 62% ClCH<sub>2</sub>CO-L-Asp-OH, which was treated NH<sub>3</sub> in water to H-Gly-Asp-OH. The latter was esterified with MeOH containing HCl to give 87% H-Gly-Asp(OMe)-OMe, which was cyclized in water at pH 7.0 at 60° for 3 h to give 72% I (R = Me).

AN 1992:612978 CAPLUS

DN 117:212978

OREF 117:36823a,36826a

IT 4685-12-5P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
(Reactant or reagent)  
(preparation and esterification of, with methanol)

L6 ANSWER 23 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1992:147458 CAPLUS  
DOCUMENT NUMBER: 116:147458  
ORIGINAL REFERENCE NO.: 116:24825a,24828a  
TITLE: Analysis of keto acids as their methyl esters of  
2,4-dinitrophenylhydrazones derivatives by gas  
chromatography and gas chromatography-mass  
spectrometry  
AUTHOR(S): Navarro-Gonzalez, Rafael; Negron-Mendoza, Alicia;  
Albarran, Guadalupe  
CORPORATE SOURCE: Inst. Cienc. Nucl., UNAM, Mexico City, 04510, Mex.  
SOURCE: Journal of Chromatography (1991), 587(2), 247-54  
CODEN: JOCRAM; ISSN: 0021-9673  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 116:147458

AB The anal. of keto acids via reaction with 2,4-dinitrophenylhydrazine (DNP)  
and esterification with methanol-hydrochloric acid by gas  
chromatog. and gas chromatog.-mass spectrometry is described. The derivs.  
formed (DNPH) are moderately stable and are easy to analyze. The separation of  
eighteen biol. important keto acids is described. The utility of the  
method in electron impact mass spectra of DNPH derivs. is presented.

AN 1992:147458 CAPLUS

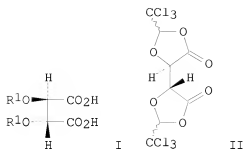
DN 116:147458

OREF 116:24825a,24828a

AB The anal. of keto acids via reaction with 2,4-dinitrophenylhydrazine (DNP)  
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chromatog. and gas chromatog.-mass spectrometry is described. The derivs.  
formed (DNPH) are moderately stable and are easy to analyze. The separation of  
eighteen biol. important keto acids is described. The utility of the  
method in electron impact mass spectra of DNPH derivs. is presented.

L6 ANSWER 24 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1989:632040 CAPLUS  
DOCUMENT NUMBER: 111:232040  
ORIGINAL REFERENCE NO.: 111:38537a,38540a  
TITLE: (R,R)-,O,O'-(2,2-Dichlorovinyl)tartaric acid: an  
easily synthesized optically pure vinyl ether. A new  
synthesis of (R,R)-O,O'-diethyltartaric acid  
Uray, Georg; Lindner, Wolfgang; Reiter, Franz  
CORPORATE SOURCE: Inst. Org. Chem., Karl-Franzens Univ., Graz, A-8010,  
Austria  
SOURCE: Synthesis (1989), (3), 194-6  
CODEN: SYNTBF; ISSN: 0039-7881  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 111:232040  
GI



AB (R,R)-Tartaric acid diethers I (R1 = CH:CC12, Et) were prepared (R,R)-Tartaric acid reacted with CC13CHO and H2SO4 to give bis-dioxolanone II, and the latter was treated with Zn in HOAc to give I (R1 = CH:CC12). The hydrogenation at I (R1 = CH:CC12) over Pd gave I (R1 = Et).

AN 1989:632040 CAPLUS

DN 111:232040

OREF 111:38537a,38540a

IT 123848-36-2P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation and ring cleavage reactions of, with methanol and ammonia)

L6 ANSWER 25 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1989:114749 CAPLUS

DOCUMENT NUMBER: 110:114749

ORIGINAL REFERENCE NO.: 110:18921a,18924a

TITLE: Stability and stereochemistry in the decomposition of pentasubstituted 1-pyrazolines controlled by interactions between bulky vicinal substituents

AUTHOR(S): Nakano, Yoshihiko; Hamaguchi, Masashi; Nagai, Toshikazu

CORPORATE SOURCE: Coll. Gen. Educ., Osaka Univ., Osaka, 560, Japan

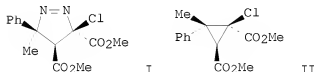
SOURCE: Journal of Organic Chemistry (1989), 54(5), 1135-44  
CODEN: JOCEAH; ISSN: 0022-3263

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 110:114749

GI



AB 1,2-Diacyl-1-chloroethylenes [e.g., (Z)- and (E)-MeO2CCCC1:CHCO2Me] reacted with disubstituted diazomethanes (e.g., Me2C:N2, MeCPh:N2, Ph2C:N2) to give pyrazolines and cyclopropanes (e.g., I and II, resp.). The thermal decomposition of the isolated pyrazolines was carried out. The thermal stability of the pyrazolines increased with the variation of the substituents at C5 in the order biphenylene < Ph, Ph < Ph, Me < Me, Me, while pyrazolines bearing bulky vicinal substituents at C3, C4, and C5 in the cis configuration were substantially more stable than other isomers. This abnormal stability is explained by the reasonable expectation that bulky C4 substituents partly inhibit conformations of the conjugated substituents at C3 or C5 favorable for the decomposition, which increases the

activation energy. Although most of the thermolyses of the pyrazolines to cyclopropanes gave products with the same configuration as the starting materials, some pyrazolines bearing bulky vicinal cis groups gave mixts. of stereoisomeric cyclopropanes. The thermolysis mechanism is discussed.

AN 1989:114749 CAPLUS

DN 110:114749

OREF 110:18921a,18924a

IT 118658-08-5P 118658-10-9P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation and esterification of, with methanol)

L6 ANSWER 26 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1988:6374 CAPLUS

DOCUMENT NUMBER: 108:6374

ORIGINAL REFERENCE NO.: 108:1215a,1218a

TITLE: Hexahydropyrroloindoles. Attempts to synthesize 2-indolyl thio ethers

AUTHOR(S): Droste, Holger; Wieland, Theodor

CORPORATE SOURCE: Max-Planck-Inst., Med. Forsch., Heidelberg, D-6900, Fed. Rep. Ger.

SOURCE: Liebigs Annalen der Chemie (1987), (11), 901-10

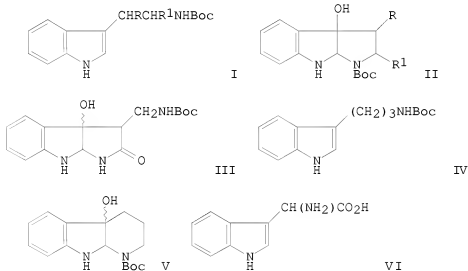
CODEN: LACHDL; ISSN: 0170-2041

DOCUMENT TYPE: Journal

LANGUAGE: German

OTHER SOURCE(S): CASREACT 108:6374

GI



AB The sensitized photochem. oxidation of tryptamines I (Boc = Me<sub>3</sub>CO<sub>2</sub>C; R = CN, CO<sub>2</sub>H, CO<sub>2</sub>Me, R<sub>1</sub> = H; R = H, R<sub>1</sub> = CO<sub>2</sub>H, H) gave hexahydropyrroloindoles II. The photochem. oxidation of I (R = CONH<sub>2</sub>, R<sub>1</sub> = H) gave ketone III, whereas homotryptamine IV gave hexahydropyrroloindole V. No azetidine formation from indolylglycine VI was observed. Attempts to synthesize title ethers from tryptamines and sulfonyl chlorides of cysteine derivs. failed.

AN 1988:6374 CAPLUS

DN 108:6374

OREF 108:1215a,1218a

IT 10184-94-8P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation and esterification with methanol)

L6 ANSWER 27 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1986:590448 CAPLUS

DOCUMENT NUMBER: 105:190448

ORIGINAL REFERENCE NO.: 105:30727a,30730a

TITLE: Chemistry of 2-bromo-3-(trichloromethyl)succinic anhydride and dimethyl ester: preparation of various halogenated succinic, maleic, fumaric and malic acid derivatives

AUTHOR(S): Nedelec, J. Y.; Blanchet, D.; Lefort, D.; Biellmann, J. F.

CORPORATE SOURCE: Lab. Electrochim., Catal. Synth. Org., CNRS, Thiais, 94320, Fr.

SOURCE: Tetrahedron (1985), 41(20), 4503-8

CODEN: TETRAB; ISSN: 0040-4020

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 105:190448

AB Various reactions of title adducts of BrCCl3 with maleic anhydride and di-Me maleate or fumarate were studied. Thus, treatment of erythro-MeO2CCHBrCH(CCl3)CO2Me with AcONa in AcOH at room temperature for 24 h afforded di-Me 2-(trichloromethyl)maleate, along with the corresponding fumarate and MeO2CCHBrC(CO2Me):CCl2.

AN 1986:590448 CAPLUS

DN 105:190448

OREF 105:30727a,30730a

IT 105048-49-5P 105048-50-8P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation and esterification with methanol)

L6 ANSWER 28 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1986:442061 CAPLUS

DOCUMENT NUMBER: 105:42061

ORIGINAL REFERENCE NO.: 105:6957a,6960a

TITLE:  $\sigma$ -Skeletal rearrangement of heptalenes: thermal transformation of heptalene-1,2-dicarboxylates into heptalene-1,3-dicarboxylates

AUTHOR(S): Bernhard, Werner; Bruegger, Paul; Daly, John J.; Englert, Gerhard; Schoenholzer, Peter; Hansen, Hans Juergen

CORPORATE SOURCE: Cent. Res. Units, F. Hoffmann-La Roche and Co., Ltd., Basel, CH-4002, Switz.

SOURCE: Helvetica Chimica Acta (1985), 68(4), 1010-24

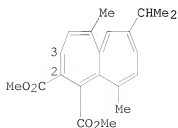
CODEN: HCACAV; ISSN: 0018-019X

DOCUMENT TYPE: Journal

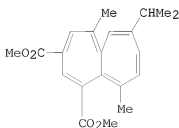
LANGUAGE: English

OTHER SOURCE(S): CASREACT 105:42061

GI



I



II

AB Di-Me 1,2-heptalenedicarboxylates rearrange to 1,3-dicarboxylates above 200°. Labeling expts. indicate that the rearrangement of I occurs by interchange of C-2 and C-3 in the heptalene skeleton. Thus, the I → II process is the 1st thermal σ-skeletal rearrangement of heptalenes. X-ray analyses of I and II are discussed.

AN 1986:442061 CAPLUS

DN 105:42061

OREF 105:6957a,6960a

IT 142-45-0

RL: RCT (Reactant); RACT (Reactant or reagent)  
(esterification of, with labeled methanol)

L6 ANSWER 29 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1986:206693 CAPLUS

DOCUMENT NUMBER: 104:206693

ORIGINAL REFERENCE NO.: 104:32741a,32744a

TITLE: Use of bromine in methanol - preparation of methyl esters

AUTHOR(S): Vairamani, M.; Rao, G. K. Viswanadha

CORPORATE SOURCE: Mass Spectrom. Div., Reg. Res. Lab., Hyderabad, 500 007, India

SOURCE: Indian Journal of Chemistry, Section B: Organic Chemistry Including Medicinal Chemistry (1985), 24B(6), 691

CODEN: IJSBDB; ISSN: 0376-4699

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 104:206693

AB Methyl esters are prepared in 92-98% yield and 95-98% purity when RCO<sub>2</sub>H [R = PhCH<sub>2</sub>, Ph, HO<sub>2</sub>CCH<sub>2</sub>CH<sub>2</sub>, Me(CH<sub>2</sub>)<sub>n</sub>; n = 10, 12, 14] with Br<sub>2</sub> in MeOH. The reaction is light and/or HBr catalyzed. An acid catalyzed mechanism for the reaction is indicated.

AN 1986:206693 CAPLUS

DN 104:206693

OREF 104:32741a,32744a

IT Use of bromine in methanol - preparation of methyl esters

ST methanol esterification bromine

IT Esterification

(of methanol-bromine as reagent for)

IT 7726-95-6, uses and miscellaneous

RL: CAT (Catalyst use); USES (Uses)

(catalyst, for esterification of carboxylic acids with methanol)

IT 93-58-3P 101-41-7P 106-65-0P 111-82-0P 112-39-0P 124-10-7P

RL: SPN (Synthetic preparation); PREP (Preparation)

(preparation of, bromine-methanol reagent for)

L6 ANSWER 30 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 1985:470927 CAPLUS

DOCUMENT NUMBER: 103:70927

ORIGINAL REFERENCE NO.: 103:11405a,11408a

TITLE: Synthesis of dialkyl esters of succinic acid

AUTHOR(S): Amirkhanyan, M. M.; Elanyan, M. F.

CORPORATE SOURCE: USSR

SOURCE: Trudy IREA (1984), 46, 7-10

CODEN: TKRKAM; ISSN: 0371-876X

DOCUMENT TYPE: Journal

LANGUAGE: Russian

OTHER SOURCE(S): CASREACT 103:70927

AB Direct esterification of HO<sub>2</sub>CCH<sub>2</sub>CH<sub>2</sub>CO<sub>2</sub>H (I) with 4 equiv MeOH and EtOH in 50 mL C<sub>6</sub>H<sub>6</sub> containing 40 g KU-2 + 8 catalyst per mol I at 110° for 10 h and 140° for 6 h, resp., gave 83.2% di-Me and 96.5% di-Et



succinate, resp.  
 AN 1985:470927 CAPLUS  
 DN 103:70927  
 OREF 103:11405a,11408a  
 IT Process optimization  
 (for esterification of succinic acid with methanol and ethanol)  
 IT Esterification  
 (of succinic acid with methanol and ethanol, optimization of)

L6 ANSWER 31 OF 31 CAPLUS COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 1983:452585 CAPLUS  
 DOCUMENT NUMBER: 99:52585  
 ORIGINAL REFERENCE NO.: 99:8211a,8212a  
 TITLE: Reactions of cyclic anhydrides. Part IX. Facile esterification of carboxylic acids with organophosphorus reagents. Novel application of alkylphosphoric esters (APE)  
 AUTHOR(S): Balasubramanian, V.; Bhatia, V. G.; Wagh, S. B.  
 CORPORATE SOURCE: Sci. Res. Cent., H.P.T. Arts and R.Y.K. Sci. Coll., Nasik, 422 005, India  
 SOURCE: Tetrahedron (1983), 39(9), 1475-85  
 CODEN: TETRAB; ISSN: 0040-4020  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 OTHER SOURCE(S): CASREACT 99:52585  
 AB The APE reagent, prepared from P4010 and excess alkanol, was used for the esterification of carboxylic acids (.apprx.50), including maleanilic, fumaranilic, and succinanilic acids.  
 AN 1983:452585 CAPLUS  
 DN 99:52585  
 OREF 99:8211a,8212a  
 IT 16752-60-6  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reagent from methanol and, for esterification)

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 E1 THROUGH E62 ASSIGNED

=> file casreact  

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FULL ESTIMATED COST	122.73	246.08

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L8 31 L7 AND L3

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FULL ESTIMATED COST	1.44	247.52
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L9      387445 METHANOL

=> s methanol/cn
L10     1 METHANOL/CN

=> d rn
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L10 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2009 ACS on STN
RN   67-56-1 REGISTRY
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=> file casreact		
COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	11.91	259.43
DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	0.00	-25.42

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L13 ANSWER 1 OF 29 CASREACT COPYRIGHT 2009 ACS on STN  
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NUMBER OF REACTIONS IN SPATH 1  
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AN 1

L13 ANSWER 2 OF 29 CASREACT COPYRIGHT 2009 ACS on STN  
NUMBER OF HIT REACTIONS 1  
NUMBER OF REACTIONS IN PATH 1  
NUMBER OF REACTIONS IN SPATH 1  
FIELD COUNT  
RX(1) 3  
AN 1

L13 ANSWER 3 OF 29 CASREACT COPYRIGHT 2009 ACS on STN  
NUMBER OF HIT REACTIONS 2  
NUMBER OF REACTIONS IN PATH 2  
NUMBER OF REACTIONS IN SPATH 2  
FIELD COUNT  
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AN 1

L13 ANSWER 4 OF 29 CASREACT COPYRIGHT 2009 ACS on STN  
NUMBER OF HIT REACTIONS 1  
NUMBER OF REACTIONS IN PATH 1  
NUMBER OF REACTIONS IN SPATH 1  
FIELD COUNT  
RX(8) 3  
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L13 ANSWER 5 OF 29 CASREACT COPYRIGHT 2009 ACS on STN  
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NUMBER OF REACTIONS IN PATH 1  
NUMBER OF REACTIONS IN SPATH 1  
FIELD COUNT  
RX(14) 3  
AN 1

L13 ANSWER 6 OF 29 CASREACT COPYRIGHT 2009 ACS on STN  
NUMBER OF HIT REACTIONS 1  
NUMBER OF REACTIONS IN PATH 1  
NUMBER OF REACTIONS IN SPATH 1  
FIELD COUNT  
RX(1) 3  
AN 1

L13 ANSWER 7 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

NUMBER OF HIT REACTIONS	1
NUMBER OF REACTIONS IN PATH	1
NUMBER OF REACTIONS IN SPATH	1
FIELD	COUNT
RX(1)	3
AN	1

L13 ANSWER 8 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

NUMBER OF HIT REACTIONS	4
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NUMBER OF REACTIONS IN SPATH	4
FIELD	COUNT
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RX(20)	3
RX(23)	3
RX(24)	3
AN	1

L13 ANSWER 9 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

NUMBER OF HIT REACTIONS	1
NUMBER OF REACTIONS IN PATH	1
NUMBER OF REACTIONS IN SPATH	1
FIELD	COUNT
RX(1)	3
AN	1

L13 ANSWER 10 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

NUMBER OF HIT REACTIONS	1
NUMBER OF REACTIONS IN PATH	1
NUMBER OF REACTIONS IN SPATH	1
FIELD	COUNT
RX(1)	3
AN	1

L13 ANSWER 11 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

NUMBER OF HIT REACTIONS	2
NUMBER OF REACTIONS IN PATH	1
NUMBER OF REACTIONS IN SPATH	2
FIELD	COUNT
RX(2)	3
RX(3)	3
AN	1

L13 ANSWER 12 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

NUMBER OF HIT REACTIONS	2
NUMBER OF REACTIONS IN PATH	1
NUMBER OF REACTIONS IN SPATH	2
FIELD	COUNT
RX(2)	3
RX(9)	3
AN	1

L13 ANSWER 13 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

NUMBER OF HIT REACTIONS	2
NUMBER OF REACTIONS IN PATH	1
NUMBER OF REACTIONS IN SPATH	2
FIELD	COUNT

RX(3)	4
RX(5)	4
AN	1

L13 ANSWER 14 OF 29 CASREACT	COPYRIGHT 2009 ACS on STN
NUMBER OF HIT REACTIONS	1
NUMBER OF REACTIONS IN PATH	1
NUMBER OF REACTIONS IN SPATH	1
FIELD	COUNT
RX(1)	3
AN	1

L13 ANSWER 15 OF 29 CASREACT	COPYRIGHT 2009 ACS on STN
NUMBER OF HIT REACTIONS	2
NUMBER OF REACTIONS IN PATH	2
NUMBER OF REACTIONS IN SPATH	2
FIELD	COUNT
RX(7)	4
RX(9)	4
AN	1

L13 ANSWER 16 OF 29 CASREACT	COPYRIGHT 2009 ACS on STN
NUMBER OF HIT REACTIONS	1
NUMBER OF REACTIONS IN PATH	1
NUMBER OF REACTIONS IN SPATH	1
FIELD	COUNT
RX(18)	4
AN	1

L13 ANSWER 17 OF 29 CASREACT	COPYRIGHT 2009 ACS on STN
NUMBER OF HIT REACTIONS	1
NUMBER OF REACTIONS IN PATH	1
NUMBER OF REACTIONS IN SPATH	1
FIELD	COUNT
RX(8)	4
AN	1

L13 ANSWER 18 OF 29 CASREACT	COPYRIGHT 2009 ACS on STN
NUMBER OF HIT REACTIONS	1
NUMBER OF REACTIONS IN PATH	1
NUMBER OF REACTIONS IN SPATH	1
FIELD	COUNT
RX(1)	3
AN	1

L13 ANSWER 19 OF 29 CASREACT	COPYRIGHT 2009 ACS on STN
NUMBER OF HIT REACTIONS	1
NUMBER OF REACTIONS IN PATH	1
NUMBER OF REACTIONS IN SPATH	1
FIELD	COUNT
RX(2)	3
AN	1

L13 ANSWER 20 OF 29 CASREACT	COPYRIGHT 2009 ACS on STN
NUMBER OF HIT REACTIONS	3
NUMBER OF REACTIONS IN PATH	1

NUMBER OF REACTIONS IN SPATH	2
FIELD	COUNT
RX(1)	4
RX(9)	4
RX(16)	4
AN	1

L13 ANSWER 21 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

NUMBER OF HIT REACTIONS	3
NUMBER OF REACTIONS IN PATH	1
NUMBER OF REACTIONS IN SPATH	2
FIELD	COUNT
RX(3)	4
RX(6)	4
RX(8)	4
AN	1

L13 ANSWER 22 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

NUMBER OF HIT REACTIONS	3
NUMBER OF REACTIONS IN PATH	2
NUMBER OF REACTIONS IN SPATH	3
FIELD	COUNT
RX(23)	3
RX(57)	3
RX(81)	3
AN	1

L13 ANSWER 23 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

NUMBER OF HIT REACTIONS	1
NUMBER OF REACTIONS IN PATH	1
NUMBER OF REACTIONS IN SPATH	1
FIELD	COUNT
RX(3)	4
AN	1

L13 ANSWER 24 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

NUMBER OF HIT REACTIONS	1
NUMBER OF REACTIONS IN PATH	1
NUMBER OF REACTIONS IN SPATH	1
FIELD	COUNT
RX(13)	4
AN	1

L13 ANSWER 25 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

NUMBER OF HIT REACTIONS	3
NUMBER OF REACTIONS IN PATH	2
NUMBER OF REACTIONS IN SPATH	3
FIELD	COUNT
RX(4)	3
RX(5)	3
RX(14)	3
AN	1

L13 ANSWER 26 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

NUMBER OF HIT REACTIONS	2
NUMBER OF REACTIONS IN PATH	1
NUMBER OF REACTIONS IN SPATH	2



FIELD	COUNT
RX(14)	3
RX(25)	3
AN	1

L13 ANSWER 27 OF 29 CASREACT	COPYRIGHT 2009 ACS on STN
NUMBER OF HIT REACTIONS	2
NUMBER OF REACTIONS IN PATH	2
NUMBER OF REACTIONS IN SPATH	2
FIELD	COUNT
RX(3)	4
RX(9)	4
AN	1

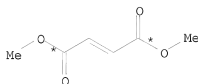
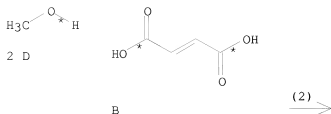
L13 ANSWER 28 OF 29 CASREACT	COPYRIGHT 2009 ACS on STN
NUMBER OF HIT REACTIONS	1
NUMBER OF REACTIONS IN PATH	1
NUMBER OF REACTIONS IN SPATH	1
FIELD	COUNT
RX(1)	3
AN	1

L13 ANSWER 29 OF 29 CASREACT	COPYRIGHT 2009 ACS on STN
NUMBER OF HIT REACTIONS	4
NUMBER OF REACTIONS IN PATH	4
NUMBER OF REACTIONS IN SPATH	4
FIELD	COUNT
RX(5)	3
RX(16)	3
RX(26)	3
RX(61)	3
AN	1

=> d ibib abs hit 1-29

L13 ANSWER 1 OF 29 CASREACT	COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER:	144:369644 CASREACT
TITLE:	Catalytic synthesis of dimethyl fumarate with phosphotungstic acid
AUTHOR(S):	Li, Yangshu; Yu, Bin
CORPORATE SOURCE:	Science School, Nanjing University of Technology, Nanjing, 210009, Peop. Rep. China
SOURCE:	Huagong Shikan (2004), 18(2), 57-58 CODEN: HUSHFT; ISSN: 1002-154X
PUBLISHER:	Huagong Shikan Zazhishe
DOCUMENT TYPE:	Journal
LANGUAGE:	Chinese
AB	Phosphotungstic acid was used as an esterification catalyst for synthesizing di-Me fumarate (DMF), with maleic anhydride as the starting material and potassium bromate KBrO <sub>3</sub> as the isomerizing agent. This method has the advantages of requiring small amount of catalyst with high catalysis activity, resulting in shorter reaction time and high DMF yield (typically over 90%). The purification procedure of DMF is simple.

RX(2) OF 3 ...2 D + B ==> E



YIELD 90%

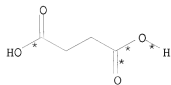
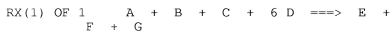
RX(2) RCT D 67-56-1, B 110-17-8  
 PRO E 624-49-7  
 CAT 1343-93-7 Tungstate(3-),  
 tetracosam-μ-oxododecaoxo[μ12-[phosphato(3-)-  
 κO:κO:κO:κO':κO':κO':κ  
 O':κO':κO':κO':κO':κO']]  
 odeda-, hydrogen (1:3)  
 CON 7 hours, reflux  
 NTE optimization study  
 AN 144:369644 CASREACT

L13 ANSWER 2 OF 29 CASREACT COPYRIGHT 2009 ACS on SIN  
 ACCESSION NUMBER: 142:176440 CASREACT  
 TITLE: Recovering of dibasic acid ester from waste alkali  
 liquor of caprolactam preparation  
 INVENTOR(S): Zhou, Xianjun; Wang, Keshun; Wu, Chonghe; Liu,  
 Yaozhong; Jiang, Ping  
 PATENT ASSIGNEE(S): Zhongxinghua Industrial Co., Ltd., Peop. Rep. China  
 SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 19 pp.  
 CODEN: CNXXEV  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Chinese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

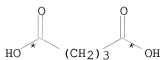
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1401624	A	20030312	CN 2001-124260	20010820
CN 1172898	C	20041027		

PRIORITY APPLN. INFO.: CN 2001-124260 20010820  
 AB The recovering method comprises: (1) neutralizing the waste alkali liquor  
 of caprolactam preparation to sep. aqueous phase and organic phase and  
 oxidizing the  
 organic substance in the organic phase with an oxidant selected from HNO<sub>3</sub>,  
 H<sub>2</sub>O<sub>2</sub>,  
 HClO<sub>4</sub>, or KMnO<sub>4</sub>, (2) transferring the reaction product of the dibasic acid  
 into a two-segments concentration unit to recover monobasic acid and HNO<sub>3</sub> in  
 the

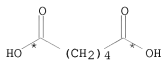
first segment and decompose the residual HNO<sub>3</sub> and nitro compound in the second segment to obtain crude C4-6 dibasic acid, (3) esterifying with C1-4 alc. in the presence of catalyst, such as H<sub>2</sub>SO<sub>4</sub>, H<sub>3</sub>PO<sub>4</sub>, HNO<sub>3</sub>, sulfonic acid, and cationic exchange resin, and distilling



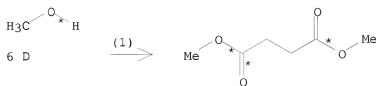
A



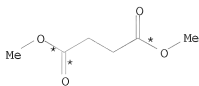
B



C

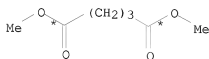


6 D



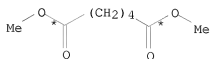
E

YIELD 94%



F

YIELD 96%



G

YIELD 90%

RX(1) RCT A 110-15-6, B 110-94-1, C 124-04-9, D 67-56-1  
 PRO E 106-65-0, F 1119-40-0, G 627-93-0  
 CON SUBSTAGE(1) 2 hours, 90 deg C  
 SUBSTAGE(2) 4 hours, 120 deg C  
 NTE yield depends on reaction conditions  
 AN 142:176440 CASREACT

L13 ANSWER 3 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 141:259007 CASREACT

TITLE: Synthesis of chiral phosphoantigens and their activity in  $\gamma\delta$  T cell stimulation

AUTHOR(S): Song, Yongcheng; Zhang, Yonghui; Wang, Hong; Raker, Amy; Sanders, John; Broderick, Erin; Clark, Allen; Morita, Craig; Oldfield, Eric

CORPORATE SOURCE: Department of Chemistry, University of Illinois at Urbana-Champaign, Urbana, IL, 61801, USA

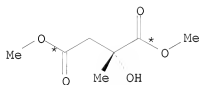
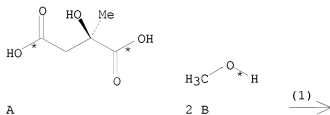
SOURCE: Bioorganic & Medicinal Chemistry Letters (2004), 14(17), 4471-4477

PUBLISHER: CODEN: BMCLE8; ISSN: 0960-894X  
 Elsevier B.V.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB  $\gamma\delta$  T cells expressing V $\gamma$ 2V $\delta$ 2 T cell receptors are activated by a broad range of phosphorus-containing small mols., termed phosphoantigens, and are of interest in the context of the chemotherapy of B cell malignancies. Here, we report the synthesis of four pairs of chiral phosphoantigens: the bromohydrins of isopentenyl diphosphate (PhosphostimTM), the epoxides of isopentenyl diphosphate (EIPP); and the corresponding bromohydrin and epoxide analogs of but-3-enyl diphosphate. The ability of each compound to stimulate human V $\gamma$ 2V $\delta$ 2 T cells was determined by TNF- $\alpha$  release and cell proliferation. In these assays, the (R)-bromohydrin diphosphates, were, on average, about twice as active as the (S)-bromohydrin diphosphates. In contrast, the (S)-form of EIPP was about twice as active as (R)-EIPP. The activities of the epoxy but-3-enyl diphosphates were both very low. These results suggest that chiral phosphoantigens, as opposed to racemic mixts., may have utility in immunotherapy.

REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

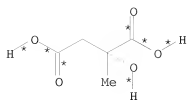
RX(1) OF 27 A + 2 B ==> C



C  
 YIELD 99%

RX(1) RCT A 6236-10-8, B 67-56-1  
 RGT D 7719-09-7 SOC12  
 PRO C 81426-68-8  
 NTE enantiomer prepared similarly

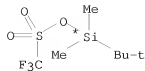
RX(2) OF 27 A + 2 B + E ==> F...



A

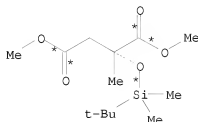


2 B



E

(2) →



F

YIELD 84%

RX(2) RCT A 6236-10-8, B 67-56-1

STAGE(1)

RGT D 7719-09-7 SOC12

STAGE(2)

RCT E 69739-34-0

RGT G 121-44-8 Et3N

PRO F 756836-62-1

NTE enantiomer prepared similarly

AN 141:259007 CASREACT

L13 ANSWER 4 OF 29 CASREACT COPYRIGHT 2009 ACS on SIN

ACCESSION NUMBER: 141:191003 CASREACT

TITLE: Reactions of 2H-3,1-benzoxazine -2,4(1H)-dione

AUTHOR(S): Milea, M.; Csunderlik, C.; Fota, Daniela

CORPORATE SOURCE: Department of Organic Chemistry, The University

"POLITEHNICA" Timisoara, Timisoara, RO-1900, Rom.

SOURCE: Buletinul Stiintific al Universitatii "Politehnica"

din Timisoara Romania, Seria Chimie si Mediului

(2000), 45(1), 163-167

CODEN: BSIMFG; ISSN: 1224-6018

PUBLISHER: Universitatii "Politehnica" din Timisoara

DOCUMENT TYPE: Journal

LANGUAGE: English

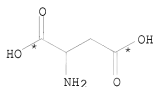
AB Reactions of isatoic anhydride (2H-3,1-benzoxazine -2,4(1H)-dione) with alcs. and phenols, both in the presence or absence of basic catalysts, have been studied, conditions have been established and the products characterized by physico-chemical methods. Also the reactions of isatoic anhydride with Me esters of  $\alpha$ -amino acids were studied among the reactions of isatoic anhydride with nitrogen nucleophiles.

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

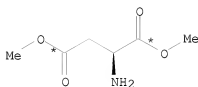
RX(8) OF 18 2 N + R ==> S...



2 N



R



S  
YIELD 46%

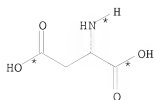
RX(8) RCT N 67-56-1, R 617-45-8  
RGT Q 7719-09-7 SOC12  
PRO S 6384-18-5  
CON 13 hours, 60 deg C  
AN 141:191003 CASREACT

L13 ANSWER 5 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 141:54226 CASREACT  
TITLE: Synthesis of 2-(5-methyl-2-phenyl-4-oxazolyl)ethanol  
AUTHOR(S): Wang, Ya-Lou; Liu, Xing; Li, Jiang-Chuan  
CORPORATE SOURCE: Department of Medicinal Chemistry, China  
Pharmaceutical University, Nanjing, 210009, Peop. Rep.  
China  
SOURCE: Yingyong Huaxue (2004), 21(1), 104-106  
CODEN: YIHUED; ISSN: 1000-0518  
PUBLISHER: Kexue Chubanshe  
DOCUMENT TYPE: Journal  
LANGUAGE: Chinese

AB 2-(5-Methyl-2-phenyl-4-oxazolyl)ethanol (I) was synthesized from L-aspartic acid via 5-step reactions; esterification, N-benzoylation, Dakin-West reaction, cyclization and reduction using LiAlH<sub>4</sub> in about 31.2% overall yield. Reacting L-aspartic acid with methanol in 0 °C gave 72.6% L-aspartic acid β-Me ester hydrochloride, which was benzoylated to give 82.0% N-benzoyl-L-aspartic acid β-Me ester (II). Dakin-West reaction of II gave 74.4% Me 3-benzamido-4-oxovalerate, which was cyclized in toluene by POCl<sub>3</sub> to give 81.8% Me 2-(5-methyl-2-phenyl-4-oxazolyl)acetate, the latter can easily convert to I by treatment with ether solution of LiAlH<sub>4</sub> in yield of 86%. All the compds. were characterized by <sup>1</sup>H NMR, IR and elemental anal.

RX(14) OF 15 COMPOSED OF RX(5), RX(1), RX(2)  
RX(14) Q + R + B + H ==> I



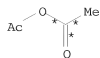
Q



R

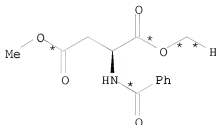


B



H

3  
STEPS  
→



I

YIELD 74%

RX(5) RCT Q 56-84-8, R 67-56-1  
RGT S 7719-09-7 SOCl<sub>2</sub>  
PRO A 16856-13-6  
CON 2.5 hours, 40 deg C

RX(1) RCT A 16856-13-6, B 98-88-4

STAGE(1)

RGT D 121-44-8 Et<sub>3</sub>N  
SOL 75-09-2 CH<sub>2</sub>Cl<sub>2</sub>  
CON 1.5 hours, 0 deg C

STAGE(2)

RGT E 7647-01-0 HCl  
SOL 7732-18-5 Water

PRO C 39741-26-9

RX(2) RCT C 39741-26-9, H 108-24-7

STAGE(1)

SOL 110-86-1 Pyridine  
CON 3 hours, 90 deg C

STAGE(2)

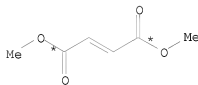
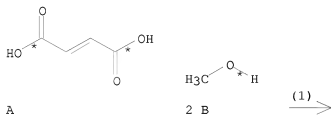
RGT E 7647-01-0 HCl  
SOL 7732-18-5 Water  
CON pH 2

PRO I 86555-45-5

AN 141:54226 CASREACT

TITLE: Catalytic synthesis of dimethyl fumarate using solid-supported superacid catalyst  
 AUTHOR(S): Zhao, Lifang; He, Zhusheng; Ma, Yuying  
 CORPORATE SOURCE: Dept. Chem. + Chem. Eng., Baoji Coll. Arts + Sci., Baoji, 721007, Peop. Rep. China  
 SOURCE: Baoji Wenli Xueyuan Xuebao, Ziran Kexueban (2002), 22(2), 138-140  
 CODEN: BWZKFL  
 PUBLISHER: Baoji Wenli Xueyuan Xuebao Bianjibu  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese  
 AB The preparation of supported catalyst, TiO<sub>2</sub>/La<sub>3</sub>+SO<sub>4</sub><sup>2-</sup> supported on mol. sieves, and its catalytic activity to esterification of fumarate were studied. The catalyst had fine catalytic activity. The optimum conditions of the esterification were decided by orthogonal expts. as follows: activation temperature of the catalyst was 500°, the amount of catalyst was 15% (based on the mass of fumaric acid), the mole ratio of alc. to acid was 6:1 and the reaction time was 5 h. Under the optimum reaction conditions, the yield of di-Me fumarate was up to 92.3%.

RX(1) OF 1 A + 2 B ==> C



C  
 YIELD 93%

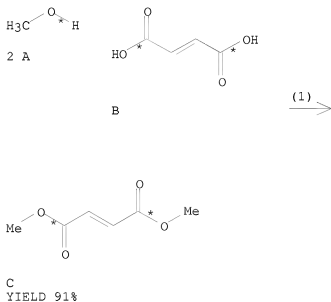
RX(1) RCT A 110-17-8, B 67-56-1  
 PRO C 624-49-7  
 CAT 7664-93-9 H<sub>2</sub>SO<sub>4</sub>, 10099-60-2 Sulfuric acid, lanthanum(3+) salt (3:2)  
 CON 3 hours, reflux  
 NTE TiO<sub>2</sub>/La/SO<sub>4</sub> supported mol. sieves used as catalyst, optimization study  
 AN 139:6591 CASREACT

L13 ANSWER 7 OF 29 CASREACT COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 138:337689 CASREACT  
 TITLE: Synthesis of dimethyl fumarate by heterogeneous supported heteropoly acid  
 AUTHOR(S): Xu, Wenyuan; Peng, Daofeng; Xiong, Guoxuan; Zhu, Xiaping



CORPORATE SOURCE: Department of Applied Chemistry, East China Institute of Technology, Fuzhou, 344000, Peop. Rep. China  
 SOURCE: Huaxue Shiji (2002), 24(6), 367-368  
 CODEN: HUSHDR; ISSN: 0258-3283  
 PUBLISHER: Huagongbu Huaxue Shiji Xinsizhan  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese  
 AB Synthesis of di-Me fumarate by esterification reaction of fumaric acid with methanol catalyzed by heterogeneous supported heteropoly acid PW12/C was studied in this paper. A careful study of the effects on the esterification reaction was done. Under these conditions, the yield of ester was about 91.6%.

RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 67-56-1, B 110-17-8  
 PRO C 624-49-7  
 CAT 1343-93-7 Tungstate(3-),  
 tetracos-μ-oxododecaoxo[μ12-[phosphato(3-)-  
 κO:κO:κO:κO':κO':κO':κ  
 O':κO':κO':κO':κO':κO']d  
 odeda-, hydrogen (1:3), 7440-44-0 Carbon  
 CON 3 hours, reflux  
 AN 138:337689 CASREACT

L13 ANSWER 8 OF 29 CASREACT COPYRIGHT 2009 ACS on SIN

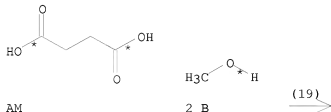
ACCESSION NUMBER: 138:271016 CASREACT  
 TITLE: A simple, convenient and expeditious route to methyl esters of carboxylic acids by thionyl chloride-methanol  
 AUTHOR(S): Chatterjee, Tapasi; Chattopadhyay, Subhagata  
 CORPORATE SOURCE: Department of Chemistry, Jadavpur University, Kolkata, 700 032, India  
 SOURCE: Oriental Journal of Chemistry (2002), 18(2), 187-190  
 CODEN: OJCHEG; ISSN: 0970-020X  
 PUBLISHER: Oriental Scientific Publishing Co.  
 DOCUMENT TYPE: Journal

LANGUAGE: English

AB A simple, convenient and expeditious preparation of 40-90% Me esters of carboxylic acids by thionyl chloride and MeOH was described. Among the 29 esters prepared were 90% 2-IC<sub>6</sub>H<sub>4</sub>CO<sub>2</sub>Me, 87% 4-MeOC<sub>6</sub>H<sub>4</sub>CO<sub>2</sub>Me and 86% Bz(CH<sub>2</sub>)<sub>2</sub>CO<sub>2</sub>Me.

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

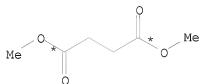
RX(19) OF 29 AM + 2 B ==> AN



AM

2 B

(19)

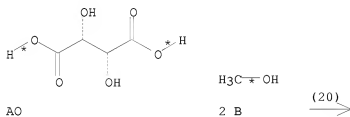


AN

YIELD 53%

RX(19) RCT AM 110-15-6, B 67-56-1  
RGT D 7719-09-7 SOC12  
PRO AN 106-65-0  
CON 2 hours, reflux

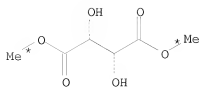
RX(20) OF 29 AO + 2 B ==> AP



AO

2 B

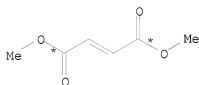
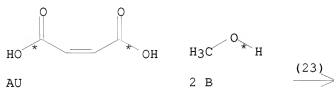
(20)



AP  
YIELD 61%

RX(20)      RCT    AO 87-69-4, B 67-56-1  
              RGT    D 7719-09-7    SOC12  
              PRO    AP 608-68-4  
              CON    2 hours, reflux

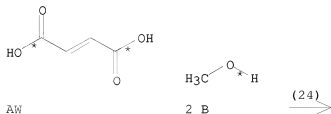
RX(23) OF 29      AU + 2 B ==> AV

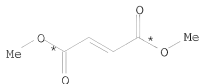


AV  
YIELD 64%

RX(23)      RCT    AU 110-16-7, B 67-56-1  
              RGT    D 7719-09-7    SOC12  
              PRO    AV 624-49-7  
              CON    2 hours, reflux

RX(24) OF 29      AW + 2 B ==> AV





AV  
YIELD 68%

RX(24) RCT AW 110-17-8, B 67-56-1  
RGT D 7719-09-7 SOCl2  
PRO AV 624-49-7  
CON 2 hours, reflux  
AN 138:271016 CASREACT

L13 ANSWER 9 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 137:352688 CASREACT  
TITLE: Catalytic reaction-distillation synthesis of dimethyl fumarate by fixed-carried heteropoly acid

AUTHOR(S): Ding, Bin; Guo, Xiangming  
CORPORATE SOURCE: Jilin Institute of Chemical Technology, Jilin, 1320022, Peop. Rep. China  
SOURCE: Dongbei Shida Xuebao, Ziran Kexueban (2001), 33(4), 61-65

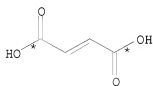
PUBLISHER: CODEN: DSZKEE; ISSN: 1000-1832  
DOCUMENT TYPE: Dongbei Shifan Daxue Xueshu Qikanshe  
LANGUAGE: Journal  
Chinese

AB A new synthesis technol. of di-Me fumarate was presented. Fumarate, methanol, and self-made fixed-carried heteropoly acid as catalyst were used. The reaction-distillation conditions were ratio of alc. and acid about 7:1; esterification temperature about 67-78°; and reaction time ≤6 h. The yield of product was up to 92%.

RX(1) OF 1 2 A + B ==> C

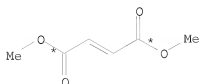


2 A



B

(1) →

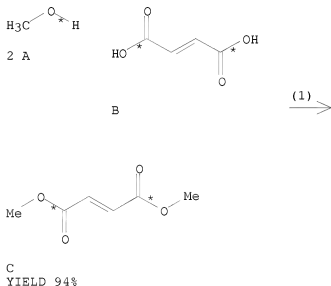


C  
YIELD 92%

RX(1) RCT A 67-56-1, B 110-17-8  
 PRO C 624-49-7  
 CAT 1343-93-7D Tungstate(3-),  
 tetracosam-μ-oxododecaoxo[μ12-[phosphato(3-)-  
 κO:κO:κO:κO':κO':κO':κ  
 O':κO':κO':κO':κO':κO']d  
 odeva-, hydrogen (1:3)  
 AN 137:352688 CASREACT

L13 ANSWER 10 OF 29 CASREACT COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 136:294520 CASREACT  
 TITLE: Synthesis of dimethyl fumarate catalyzed by  
 SO42-/TiO2/La3+ rare earth solid superacid  
 AUTHOR(S): Zhou, Jianwei  
 CORPORATE SOURCE: Department of Chemical Engineering, Pingyuan  
 University, Xinxiang, 453003, Peop. Rep. China  
 SOURCE: Henan Huagong (2001), (5), 12-14  
 CODEN: HEHUF3; ISSN: 1003-3467  
 PUBLISHER: Henansheng Shiyu Huaxue Gongye Keji Qingbao  
 Zhongxinzhuan  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese  
 AB Di-Me fumarate was synthesized from fumaric acid and methanol with  
 SO42-/TiO2/La3+ rare earth solid superacid as catalyst in dichloromethane  
 solvent. Optimum synthetic conditions were determined: molar ratio of fumaric  
 acid to methanol 6:1, dosage of catalyst 1.0 g/0.1 mol fumaric acid, time  
 4 h and solvent 25 mL. Yield of product reached above 94%.

RX(1) OF 1 2 A + B ==> C



RX(1) RCT A 67-56-1, B 110-17-8  
 PRO C 624-49-7  
 CAT 14808-79-8 Sulfate, 13463-67-7 TiO2, 215650-46-7 Sulfuric acid,  
 lanthanum(3+) salt (3:1)  
 SOL 75-09-2 CH2C12  
 AN 136:294520 CASREACT

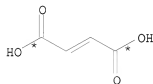
ACCESSION NUMBER: 136:279092 CASREACT  
 TITLE: Synthesis of dimethyl fumarate from maleic acid  
 AUTHOR(S): Cao, Kelin  
 CORPORATE SOURCE: Shanxi Taiming Chemical Engineering Co., Ltd., Taigu, 030800, Peop. Rep. China  
 SOURCE: Huagong Jinzhan (2001), 20(4), 33-34, 39  
 CODEN: HUJIEK; ISSN: 1000-6613  
 PUBLISHER: Huaxue Gongye Chubanshe  
 DOCUMENT TYPE: Journal  
 LANGUAGE: Chinese

AB Title compound was prepared from maleic acid, isomerized fumaric acid in the presence of ammonium persulfate as catalyst, further esterification with methanol in the presence of phosphotungstic acid as catalyst, giving product with yield over 94%. The effects of catalysts and catalyst amount on the reactions were studied.

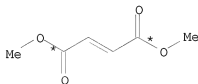
RX(2) OF 3 ...2 D + B ==> E



2 D



B

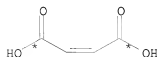


E  
YIELD 94%

RX(2) RCT D 67-56-1, B 110-17-8  
 PRO E 624-49-7  
 CAT 12067-99-1 Tungsten hydroxide oxide phosphate

RX(3) OF 3 COMPOSED OF RX(1), RX(2)

RX(3) A + 2 D ==> E

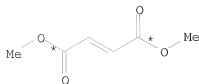


A



2 D





E  
YIELD 94%

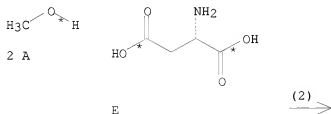
RX(1) RCT A 110-16-7  
PRO B 110-17-8  
CAT 7727-54-0 (NH4)2S2O8

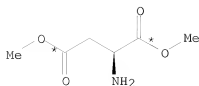
RX(2) RCT D 67-56-1, B 110-17-8  
PRO E 624-49-7  
CAT 12067-99-1 Tungsten hydroxide oxide phosphate

AN 136:279092 CASREACT

L13 ANSWER 12 OF 29 CASREACT COPYRIGHT 2009 ACS on STN  
ACCESSION NUMBER: 136:263409 CASREACT  
TITLE: Synthesis of new chiral lipophilic macrocyclic oxo polyamines  
AUTHOR(S): Yan, Qianshun; You, Jinsong; Xiang, Qingxiang; Yu, Xiaoqi; Xie, Rugang  
CORPORATE SOURCE: Department of Chemistry, Sichuan University, Chengdu, 610064, Peop. Rep. China  
SOURCE: Huaxue Yanjiu Yu Yingyong (2001), 13(2), 189-191  
CODEN: HYYIFM; ISSN: 1004-1656  
PUBLISHER: Huaxue Yanjiu Yu Yingyong Bianjibu  
DOCUMENT TYPE: Journal  
LANGUAGE: Chinese  
AB New chiral lipophilic macrocyclic oxo polyamines were synthesized from L-glutamic acid or L-aspartic acid by esterifying with methanol, acylating with dodecanoyl chloride in chloroform in the presence of K2CO3 to obtain di-Me N-dodecanoyl-L-glutamate or L-aspartate, and transacylating with diethylenetriamine or triethylenetetraamine in methanol under refluxing. Their structures were characterized by MS, 1H NMR, and elemental anal.

RX(2) OF 15 2 A + E ==> F...

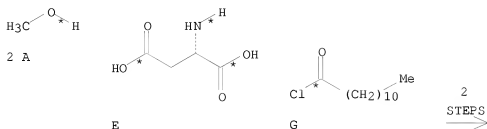




F  
YIELD 68%

RX(2) RCT A 67-56-1, E 56-84-8  
RGT D 7719-09-7 SOCl2  
PRO F 6384-18-5

RX(9) OF 15 COMPOSED OF RX(2), RX(4)  
RX(9) 2 A + E + G ==> K



K  
YIELD 66%

RX(2) RCT A 67-56-1, E 56-84-8  
RGT D 7719-09-7 SOCl2  
PRO F 6384-18-5

RX(4) RCT G 112-16-3, F 6384-18-5  
RGT I 584-08-7 K2CO3  
PRO K 258351-51-8  
SOL 67-66-3 CHCl3  
AN 136:263409 CASREACT

L13 ANSWER 13 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 135:256190 CASREACT

TITLE: Lipase-catalyzed synthesis of RGD diamide in aqueous water-miscible organic solvents

AUTHOR(S): Zhang, L.-Q.; Zhang, Y.-D.; Xu, L.; Li, X.-L.; Yang, X.-c.; Xu, G.-L.; Wu, X.-X.; Gao, H.-Y.; Du, W.-B.;



CORPORATE SOURCE: Zhang, X.-T.; Zhang, X.-Z.  
Key Laboratory of Molecular Enzymology and  
Engineering, Jilin University, Changchun, 130023,  
Peop. Rep. China

SOURCE: Enzyme and Microbial Technology (2001), 29(2-3),  
129-135  
CODEN: EMTED2; ISSN: 0141-0229

PUBLISHER: Elsevier Science Ireland Ltd.

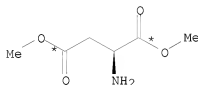
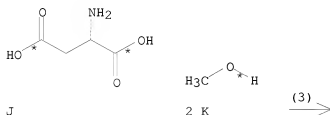
DOCUMENT TYPE: Journal

LANGUAGE: English

AB 1RGD tripeptide as the cellular adhesion factor was synthesized by a combination of chemical and enzymic methods in this study. First of all, Gly-Asp diamide was synthesized by a novel chemical method in three steps including preparation of L-aspartic acid di-Me ester, chloroacetylation of L-aspartic acid di-Me ester and ammonolysis of chloroacetyl L-aspartic acid di-Me ester. Secondly, Porcine Pancreas Lipase (PPL) was used to catalyze the synthesis of Benzyl-Arg-Gly-Asp diamide in water-organic cosolvents systems. The reaction condition was optimized by examining the main factors affecting the yield of the tripeptide. The optimal reaction condition was set up as pH7.7, 15°C in 50% DMF for 8 h with the maximum yield of 76.4%. It was also found that 50% DMSO was another alternative with the tripeptide yield of 71.7%.

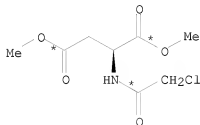
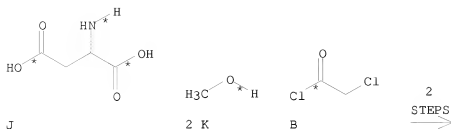
REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

RX(3) OF 6 J + 2 K ==> A...



RX(3)            RCT J 56-84-8, K 67-56-1  
                  RGT L 7647-01-0 HCl  
                  PRO A 6384-18-5  
                  SOL 67-56-1 MeOH

RX(5) OF 6 COMPOSED OF RX(3), RX(1)  
RX(5)            J + 2 K + B ==> C



C

RX(3) RCT J 56-84-8, K 67-56-1  
 RGT L 7647-01-0 HCl  
 PRO A 6384-18-5  
 SOL 67-56-1 MeOH

RX(1) RCT A 6384-18-5, B 79-04-9  
 RGT D 1310-73-2 NaOH  
 PRO C 76385-50-7  
 SOL 67-66-3  $\text{CHCl}_3$ , 7732-18-5 Water

AN 135:256190 CASREACT

L13 ANSWER 14 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 134:310893 CASREACT

TITLE: Synthesis of dimethyl fumarate catalyzed by composite solid superacid  $\text{SO}_4^{2-}/\text{TiO}_2\text{-Al}_2\text{O}_3$

AUTHOR(S): Cheng, Yonghao

CORPORATE SOURCE: Department of Chemistry, Hebei Normal University, Shijiazhuang, 050016, Peop. Rep. China

SOURCE: Riyong Huaxue Gongye (2000), 30(5), 12-13  
 CODEN: RHGOE8; ISSN: 1001-1803

PUBLISHER: Qinggongyebu Kexue Jishu Qingbao Yanjiuso

DOCUMENT TYPE: Journal

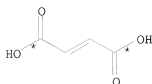
LANGUAGE: Chinese

AB Di-Me fumarate was synthesized from fumaric acid and methanol with composite solid superacid  $\text{SO}_4^{2-}/\text{TiO}_2\text{-Al}_2\text{O}_3$  as catalyst. Optimum synthetic conditions were determined: methanol:fumaric acid 6:1, time 4 h, and dosage of catalyst 3 g. Yield of product reached 91.4%.

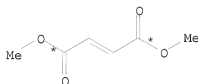
RX(1) OF 1 2 A + B ==> C



2 A



B



C

YIELD 91%

RX(1) RCT A 67-56-1, B 110-17-8  
 PRO C 624-49-7  
 CAT 14808-79-8 Sulfate, 13463-67-7 TiO<sub>2</sub>, 1344-28-1 Al<sub>2</sub>O<sub>3</sub>  
 AN 134:310893 CASREACT

L13 ANSWER 15 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 133:296252 CASREACT

TITLE: A simple method for the preparation of monomethyl esters of dicarboxylic acids by selective esterification of the nonconjugated carboxyl group in the presence of an aromatic or conjugated carboxyl group

AUTHOR(S): Ram, Ram N.; Meher, Nabin Kumar

CORPORATE SOURCE: Department of Chemistry, Indian Institute of Technology, New Delhi, 110016, India

SOURCE: Journal of Chemical Research, Synopses (2000), (6), 282-283

CODEN: JRP5DC; ISSN: 0308-2342

PUBLISHER: Science Reviews Ltd.

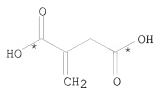
DOCUMENT TYPE: Journal

LANGUAGE: English

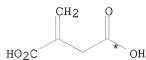
AB Various dicarboxylic acids were converted selectively into monomethyl esters in which the nonconjugated carboxyl group is selectively esterified in the presence of an aromatic or conjugated carboxyl group at room temperature (.apprx.25-27°) in MeOH using a catalytic amount of SOCl<sub>2</sub>.

REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

RX(7) OF 9 2 W + 3 B ==> X + Y



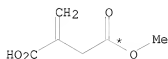
W



W

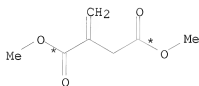


3 B



X

YIELD 90%



Y

YIELD 4%

RX(7) RCT W 97-65-4, B 67-56-1

STAGE(1)

CAT 7719-09-7 SOCl2

SOL 67-56-1 MeOH

STAGE(2)

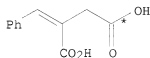
RGT E 7647-01-0 HCl

SOL 7732-18-5 Water

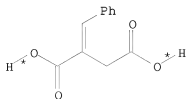
PRO X 7338-27-4, Y 617-52-7

NTE chemoselective

RX(9) OF 9 2 AC + 3 B ==> AD + AE



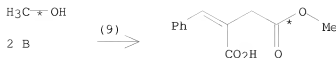
AC



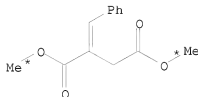
AC



B



AD  
YIELD 85%



AE  
YIELD 10%

RX(9) RCT AC 5653-88-3, B 67-56-1

STAGE(1)

CAT 7719-09-7 SOCl<sub>2</sub>

SOL 67-56-1 MeOH

STAGE(2)

RGT E 7647-01-0 HCl

SOL 7732-18-5 Water

PRO AD 38418-34-7, AE 80459-39-8

NTE chemoselective

AN 133:296252 CASREACT

L13 ANSWER 16 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 130:66049 CASREACT

TITLE: A selective method for the preparation of aliphatic methyl esters in the presence of aromatic carboxylic acids

AUTHOR(S): Rodriguez, A.; Nomen, M.; Spur, B. W.

CORPORATE SOURCE: Department of Cell Biology, Univ. of Medicine and Dentistry of New Jersey, Stratford, NJ, 08084, USA

SOURCE: Tetrahedron Letters (1998), 39(47), 8563-8566

CODEN: TELEAY; ISSN: 0040-4039

PUBLISHER: Elsevier Science Ltd.

DOCUMENT TYPE: Journal

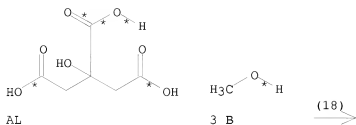
LANGUAGE: English

AB 2,2-Dimethoxypropane, methanol and a catalytic amount of HCl selectively esterify aliphatic carboxylic acids in the presence of aromatic carboxylic acids

at room temperature and in high yields.

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

RX(18) OF 22 AL + 3 B ==> AM



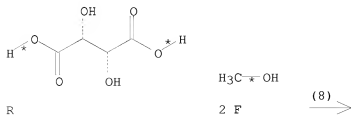
RX(18) RCT AL 77-92-9, B 67-56-1  
 RGT D 77-76-9 Me2C(OMe)2  
 PRO AM 1587-20-8  
 CAT 75-77-4 Me3SiCl  
 SOL 67-56-1 MeOH  
 NTE chemoselective, arom. acids are not esterified  
 AN 130:66049 CASREACT

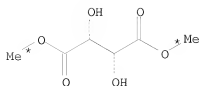
L13 ANSWER 17 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 121:280006 CASREACT  
 TITLE: A convenient and mild procedure for the preparation of hydroxy esters from lactones and hydroxy acids  
 AUTHOR(S): Anand, R. C.; Selvapalam, N.  
 CORPORATE SOURCE: Dep. Chem., Indian Inst. Technol., New Delhi, 110016, India  
 SOURCE: Synthetic Communications (1994), 24(19), 2743-7  
 CODEN: SYNCAV; ISSN: 0039-7911  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB An alc. solution of lactones and hydroxy acids stored on Amberlyst-15 results in the formation of corresponding hydroxy esters in high yields.

RX(8) OF 8 R + 2 F ==> S





S  
YIELD 85%

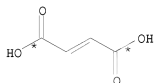
RX(8) RCT R 87-69-4, F 67-56-1  
RGT D 9037-24-5 Amberlyst 15  
PRO S 608-68-4  
SOL 67-56-1 MeOH  
AN 121:280006 CASREACT

L13 ANSWER 18 OF 29 CASREACT COPYRIGHT 2009 ACS on STN  
ACCESSION NUMBER: 120:269626 CASREACT  
TITLE: Catalytic synthesis of dimethyl fumarate with ferric chloride  
AUTHOR(S): Yu, Shanxin; Lei, Huanwen  
CORPORATE SOURCE: Dep. Chem., Hunan Norm. Univ., Changsha, 410081, Peop. Rep. China  
SOURCE: Huaxue Shiji (1993), 15(6), 374, 376  
CODEN: HUSHDR; ISSN: 0258-3283  
DOCUMENT TYPE: Journal  
LANGUAGE: Chinese  
AB Ferric chloride (FeCl<sub>3</sub>·6H<sub>2</sub>O) can be used as a catalyst for the esterification reaction of fumaric acid instead of sulfuric acid. The conditions in synthesis of di-Me fumarate catalyzed with FeCl<sub>3</sub>·6H<sub>2</sub>O are described. The advantages of this method are: simple procedure, mild reaction conditions, non-corrosive, less pollution and purer product.

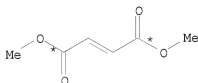
RX(1) OF 1 2 A + B ==> C



2 A



B



C  
YIELD 61%

RX(1) RCT A 67-56-1, B 110-17-8  
PRO C 624-49-7  
CAT 7705-08-0 FeCl<sub>3</sub>  
AN 120:269626 CASREACT

L13 ANSWER 19 OF 29 CASREACT COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 119:226419 CASREACT  
 TITLE: Method for preparing amino acid esters involving  
 (continuous) addition and distillation of alcohols  
 INVENTOR(S): Takemoto, Tadashi; Takeda, Hideo  
 PATENT ASSIGNEE(S): Ajinomoto Co., Inc., Japan  
 SOURCE: Eur. Pat. Appl., 4 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

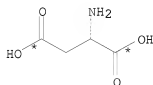
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 544205	A2	19930602	EP 1992-119898	19921123
EP 544205	A3	19930728		
EP 544205	B1	19950906		
R: BE, CH, DE, FR, GB, IT, LI, NL				
JP 05148199	A	19930615	JP 1991-314585	19911128
CA 2084012	A1	19930529	CA 1992-2084012	19921127
US 5424476	A	19950613	US 1994-194635	19940210
PRIORITY APPLN. INFO.:			JP 1991-314585	19911128
			US 1992-982123	19921125

AB Amino acid esters were prepared by heating a mixture of an amino acid, an alc., and H<sub>2</sub>SO<sub>4</sub> with simultaneous addition of liquid or gaseous alc. to the reaction mixture and distillation of the same. Thus, H-Phe-OH in MeOH containing cat.  
 H<sub>2</sub>SO<sub>4</sub> was kept at 85° for 4 h with simultaneous addition and distillation of MeOH to give 98.6% H-Phe-OMe. Simple reflux of the above reactants gave a yield of only 83-2% product.

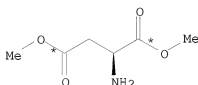
RX(2) OF 4 2 A + E ==> F



2 A



E



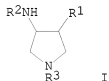
F  
YIELD 99%

RX(2) RCT A 67-56-1, E 56-84-8  
 PRO F 6384-18-5  
 CAT 7664-93-9 H<sub>2</sub>SO<sub>4</sub>  
 NTE continuous addn. and distn. of methanol  
 AN 119:226419 CASREACT



ACCESSION NUMBER: 119:180649 CASREACT  
 TITLE: Preparation of pyrrolidine derivatives from amino acids.  
 INVENTOR(S): Hirabayashi, Satoshi; Ike, Kazuo; Zanka, Atuhiko; Kawakami, Takeshi; Ichihara, Masaharu  
 PATENT ASSIGNEE(S): Fujisawa Pharmaceutical Co., Ltd., Japan  
 SOURCE: PCT Int. Appl., 20 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9220652	A1	19921126	WO 1992-JP648	19920520
W: JP, US RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, MC, NL, SE JP 04346971 A 19921202 JP 1991-219431 19910521 JP 1991-219431 19910521				
PRIORITY APPLN. INFO.: OTHER SOURCE(S): MARPAT 119:180649 GI				

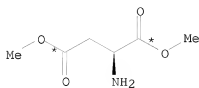
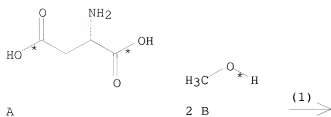


AB Reaction of R2-NH-CH(CO2-R5)-CH2-CO2-R4 (R2, R4, R5 = protecting group) with R1-X [R1 = alkyl; X = leaving group] gives R2-NH-CH(CO2-R5)-CH(R1)-CO2-R4, whose reduction gives R2-NH-CH(CH2OH)-CH(R1)-CH2OH, whose condensation with H2N-R3 (R3 = protecting group) gives pyrrolidine derivs. I, which are optionally deprotected. Di-Me (S)-aspartate hydrochloride (preparation given) in CH2Cl2 was mixed with a saturated aqueous solution of NaHCO3, tert-di-Bu dicarbonate

was added, and the resulting mixture was allowed to stand overnight to give di-Me (S)-N-tert-butoxycarbonylaspartate, which was treated with MeI in THF containing hexamethyldisilazane and BuLi at -40 to -30° for 2 h to give, after adjusting to pH 7-8 with 1N HCl, a 1:1 mixture of threo- and erythro-(2S)-N-(tert-butoxycarbonyl)-3-methylaspartic acid di-Me ester, which was reduced with NaBH4 in THF-MeOH at 35-50° for 4 h to give a diastereomeric mixture of (2S)-N-(tert-butoxycarbonylamino)-3-methyl-1,4-butanediol, whose dimethyl ester was heated with benzylamine at 30-50° for 3 days to give 74% a diastereomeric mixture of 1-benzyl-3-tert-butoxycarbonylamino-4-methylpyrrolidine. (3S,4S)-1-benzyl-3-tert-butoxycarbonylamino-4-methylpyrrolidine in MeOH-H2O containing HCO2NH4 was hydrogenolyzed over Pd/C to give (3S,4S)-3-tert-butoxycarbonylamino-4-methylpyrrolidine, which in MeOH-EtOAc was treated with HCl in EtOAc at room temperature for 2 h and then

at 35° for 2 h to give (3S,4S)-3-amino-4-methylpyrrolidine.  
 REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

RX(1) OF 36 A + 2 B ==> C...

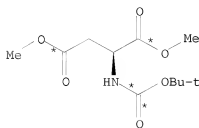
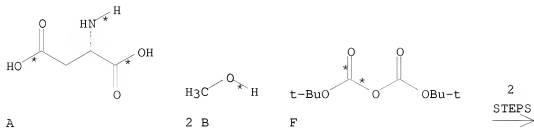


● HCl

C

RX(1)      RCT    A 56-84-8, B 67-56-1  
               RGT    D 7719-09-7 SOCl<sub>2</sub>  
               PRO    C 32213-95-9  
               SOL    67-56-1 MeOH, 68-12-2 DMF

RX(9) OF 36 COMPOSED OF RX(1), RX(2)  
 RX(9)      A + 2 B + F  $\Rightarrow$  G



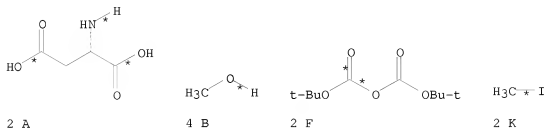
G

RX(1)      RCT    A 56-84-8, B 67-56-1

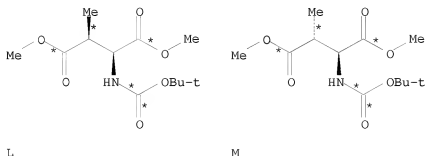
RGT D 7719-09-7 SOCl2  
 PRO C 32213-95-9  
 SOL 67-56-1 MeOH, 68-12-2 DMF

RX(2) RCT F 24424-99-5, C 32213-95-9  
 RGT H 144-55-8 NaHCO3  
 PRO G 55747-84-7  
 SOL 75-09-2 CH2Cl2, 7732-18-5 Water

RX(16) OF 36 COMPOSED OF RX(1), RX(2), RX(3)  
 RX(16) 2 A + 4 B + 2 F + 2 K ==> L + M



3  
 STEPS  
 →



RX(1) RCT A 56-84-8, B 67-56-1  
 RGT D 7719-09-7 SOCl2  
 PRO C 32213-95-9  
 SOL 67-56-1 MeOH, 68-12-2 DMF

RX(2) RCT F 24424-99-5, C 32213-95-9  
 RGT H 144-55-8 NaHCO3  
 PRO G 55747-84-7  
 SOL 75-09-2 CH2Cl2, 7732-18-5 Water

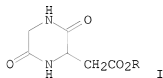
RX(3) RCT K 74-88-4, G 55747-84-7  
 RGT N 999-97-3 (Me3Si)2NH, O 109-72-8 BuLi  
 PRO L 149598-19-6, M 149598-20-9  
 SOL 109-99-9 THF

AN 119:180649 CASREACT

L13 ANSWER 21 OF 29 CASREACT COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 117:212978 CASREACT  
 TITLE: Process for preparing diketopiperazine derivatives  
 INVENTOR(S): Toshihisa, Kato; Tadashi, Takemoto  
 PATENT ASSIGNEE(S): Ajinomoto Co., Inc., Japan  
 SOURCE: Eur. Pat. Appl., 5 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

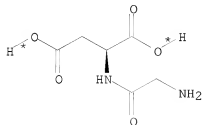
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 493812	A1	19920708	EP 1991-122307	19911227
R: BE, DE, FR, GB, NL				
JP 04234374	A	19920824	JP 1990-418592	19901227
			JP 1990-418592	19901227

PRIORITY APPLN. INFO.:  
 OTHER SOURCE(S): MARPAT 117:212978  
 GI



AB Diketopiperazines I (R = Cl-6-alkyl) were prepared by treating (chloroacetyl)aspartic acid with NH<sub>3</sub>, esterifying the resulting H-Gly-Asp-OH with an alkanol, and cyclizing the resulting diester neutral or weakly basic water or in an alkanol-water solvent mixture. Thus, L-aspartic acid was acylated with ClCH<sub>2</sub>COCl in aqueous NaOH to give 62% ClCH<sub>2</sub>CO-L-Asp-OH, which was treated NH<sub>3</sub> in water to H-Gly-Asp-OH. The latter was esterified with MeOH containing HCl to give 87% H-Gly-Asp(OMe)-OMe, which was cyclized in water at pH 7.0 at 60° for 3 h to give 72% I (R = Me).

RX(3) OF 10 ...F + 2 H ==> I...

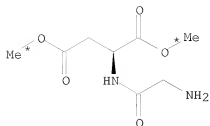


F

H<sub>3</sub>C-OH

2 H

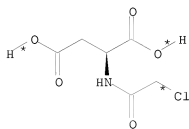
(3) →



I  
YIELD 87%

RX(3)      RCT    F 4685-12-5, H 67-56-1  
              RGT    J 7647-01-0 HCl  
              PRO    I 144168-11-6  
              SOL    67-56-1 MeOH

RX(6) OF 10 COMPOSED OF RX(2), RX(3)  
 RX(6)      C    +    2 H    ==>    I



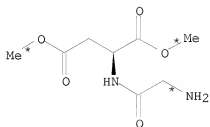
C

H<sub>3</sub>C-OH

2

STEPS  
 →

2 H



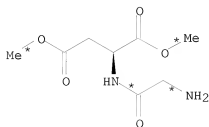
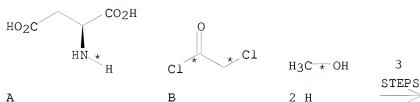
I  
YIELD 87%

RX(2)      RCT    C 67036-33-3  
              RGT    G 7664-41-7 NH3  
              PRO    F 4685-12-5  
              SOL    7732-18-5 Water

RX(3)      RCT    F 4685-12-5, H 67-56-1  
              RGT    J 7647-01-0 HCl  
              PRO    I 144168-11-6

SOL 67-56-1 MeOH

RX(8) OF 10 COMPOSED OF RX(1), RX(2), RX(3)  
RX(8) A + B + 2 H ==> I



I  
YIELD 87%

RX(1) RCT A 56-84-8, B 79-04-9  
RGT D 1310-73-2 NaOH  
PRO C 67036-33-3  
SOL 7732-18-5 Water

RX(2) RCT C 67036-33-3  
RGT G 7664-41-7 NH<sub>3</sub>  
PRO F 4685-12-5  
SOL 7732-18-5 Water

RX(3) RCT F 4685-12-5, H 67-56-1  
RGT J 7647-01-0 HCl  
PRO I 144168-11-6  
SOL 67-56-1 MeOH

AN 117:212978 CASREACT

L13 ANSWER 22 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

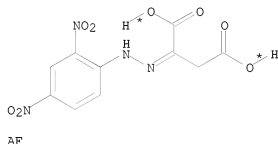
ACCESSION NUMBER: 116:147458 CASREACT  
TITLE: Analysis of keto acids as their methyl esters of  
2,4-dinitrophenylhydrazone derivatives by gas  
chromatography and gas chromatography-mass  
spectrometry  
AUTHOR(S): Navarro-Gonzalez, Rafael; Negron-Mendoza, Alicia;  
Albarran, Guadalupe  
CORPORATE SOURCE: Inst. Cienc. Nucl., UNAM, Mexico City, 04510, Mex.  
SOURCE: Journal of Chromatography (1991), 587(2), 247-54  
CODEN: JOCRAM; ISSN: 0021-9673  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB The anal. of keto acids via reaction with 2,4-dinitrophenylhydrazine (DNP)

and esterification with methanol-hydrochloric acid by gas chromatog. and gas chromatog.-mass spectrometry is described. The derivs. formed (DNPH) are moderately stable and are easy to analyze. The separation of eighteen biol. important keto acids is described. The utility of the method in electron impact mass spectra of DNPH derivs. is presented.

RX(23) OF 90 ...2 D + AF ==> AG...

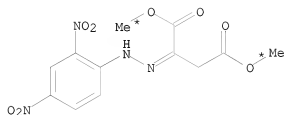
H<sub>3</sub>C-~~OH~~

2 D



AF

(23) →



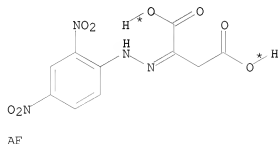
AG

RX(23) RCT D 67-56-1, AF 2891-14-7  
RGT F 7647-01-0 HCl  
PRO AG 6745-50-2  
SOL 7732-18-5 Water

RX(57) OF 90 2 D + AF ==> AG

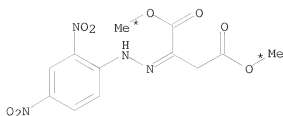
H<sub>3</sub>C-~~OH~~

2 D



AF

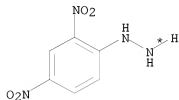
(57) →



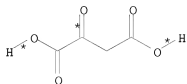
AG

RX(57) RCT D 67-56-1, AF 2891-14-7  
 RGT F 7647-01-0 HCl  
 PRO AG 6745-50-2  
 SOL 7732-18-5 Water

RX(81) OF 90 COMPOSED OF RX(22), RX(23)  
 RX(81) A + AE + 2 D ==> AG



A

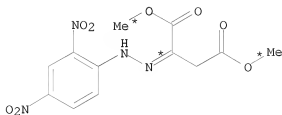


AE

H<sub>3</sub>C-OH

2 D

2  
 STEPS  
 →



AG

RX(22) RCT A 119-26-6, AE 328-42-7  
 PRO AF 2891-14-7

RX(23) RCT D 67-56-1, AF 2891-14-7  
 RGT F 7647-01-0 HCl  
 PRO AG 6745-50-2  
 SOL 7732-18-5 Water

AN 116:147458 CASREACT

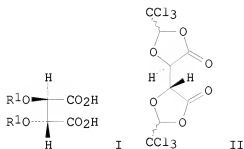
L13 ANSWER 23 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 111:232040 CASREACT

TITLE: (R,R)-O,O'-(2,2-Dichlorovinyl)tartaric acid: an  
 easily synthesized optically pure vinyl ether. A new  
 synthesis of (R,R)-O,O'-diethyltartaric acid

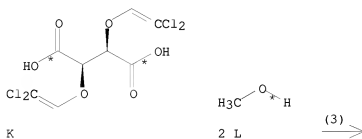


AUTHOR(S): Uray, Georg; Lindner, Wolfgang; Reiter, Franz  
 CORPORATE SOURCE: Inst. Org. Chem., Karl-Franzens Univ., Graz, A-8010, Austria  
 SOURCE: Synthesis (1989), (3), 194-6  
 CODEN: SYNTBF; ISSN: 0039-7881  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 GI



AB (R,R)-Tartaric acid diethers I (R1 = CH:CCl2, Et) were prepared (R,R)-Tartaric acid reacted with CCl3CHO and H2SO4 to give bis-dioxolanone II, and the latter was treated with Zn in HOAc to give I (R1 = CH:CCl2). The hydrogenation at I (R1 = CH:CCl2) over Pd gave I (R1 = Et).

RX(3) OF 18 K + 2 L ==> M

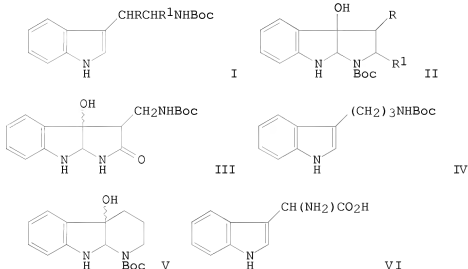


M  
 YIELD 68%

RX(3) RCT K 123848-33-9, L 67-56-1  
 RGT N 104-15-4 TsOH  
 PRO M 123848-34-0

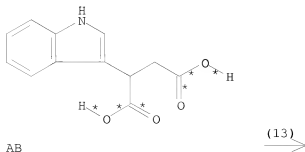
SOL 67-56-1 MeOH  
AN 111:232040 CASREACT

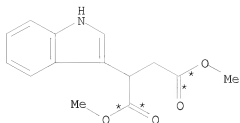
L13 ANSWER 24 OF 29 CASREACT COPYRIGHT 2009 ACS on STN  
ACCESSION NUMBER: 108:6374 CASREACT  
TITLE: Hexahydropyrroloindoles. Attempts to synthesize  
2-indolyl thio ethers  
AUTHOR(S): Droste, Holger; Wieland, Theodor  
CORPORATE SOURCE: Max-Planck-Inst., Med. Forsch., Heidelberg, D-6900,  
Fed. Rep. Ger.  
SOURCE: Liebigs Annalen der Chemie (1987), (11), 901-10  
CODEN: LACHDL; ISSN: 0170-2041  
DOCUMENT TYPE: Journal  
LANGUAGE: German  
GI



AB The sensitized photochem. oxidation of tryptamines I (Boc = Me<sub>3</sub>CO<sub>2</sub>C; R = CN, CO<sub>2</sub>H, CO<sub>2</sub>Me, R<sub>1</sub> = H; R = H, R<sub>1</sub> = CO<sub>2</sub>H, H) gave hexahydropyrroloindoles II. The photochem. oxidation of I (R = CONH<sub>2</sub>, R<sub>1</sub> = H) gave ketone III, whereas homotryptamine IV gave hexahydropyrroloindole V. No azetidine formation from indolylglycine VI was observed Attempts to synthesize title ethers from tryptamines and sulfonyl chlorides of cysteine derivs. failed.

RX(13) OF 317 ...AB ==> AC...





AC  
YIELD 95%

RX(13) RCT AB 10184-94-8  
RGT AD 7719-09-7 SOC12, Q 67-56-1 MeOH, AE 110-86-1  
Pyridine, AF 1122-58-3 4-DMAF  
PRO AC 100711-44-2  
SOL 67-56-1 MeOH  
AN 108:6374 CASREACT

L13 ANSWER 25 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 105:190448 CASREACT  
TITLE: Chemistry of 2-bromo-3-(trichloromethyl)succinic anhydride and dimethyl ester: preparation of various halogenated succinic, maleic, fumaric and malic acid derivatives

AUTHOR(S): Nedelec, J. Y.; Blanchet, D.; Lefort, D.; Biellmann, J. F.

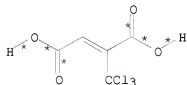
CORPORATE SOURCE: Lab. Electrochim., Catal. Synth. Org., CNRS, Thiais, 94320, Fr.

SOURCE: Tetrahedron (1985), 41(20), 4503-8  
CODEN: TETRAB; ISSN: 0040-4020

DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Various reactions of title adducts of BrCC13 with maleic anhydride and di-Me maleate or fumarate were studied. Thus, treatment of erythro-MeO2CCHBrCH(CCl3)CO2Me with AcONa in AcOH at room temperature for 24 h afforded di-Me 2-(trichloromethyl)maleate, along with the corresponding fumarate and MeO2CCHBrC(CO2Me):CCl2.

RX(4) OF 19 ...K + 2 L ==> B

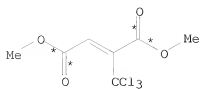


K



2 L

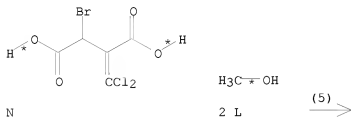
(4) ➡



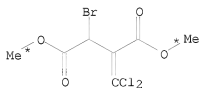
B

RX(4)      RCT   K 105048-49-5, L 67-56-1  
              RGT   M 7664-93-9 H<sub>2</sub>SO<sub>4</sub>  
              PRO   B 105048-44-0

RX(5) OF 19      ...N + 2 L ==> F...



N

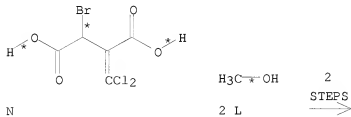


F

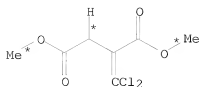
RX(5)      RCT   N 105048-50-8, L 67-56-1  
              RGT   M 7664-93-9 H<sub>2</sub>SO<sub>4</sub>  
              PRO   F 105048-45-1

RX(14) OF 19 COMPOSED OF RX(5), RX(7)

RX(14)      N + 2 L ==> R



N



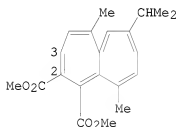
R

RX(5) RCT N 105048-50-8, L 67-56-1  
 RGT M 7664-93-9 H2SO4  
 PRO F 105048-45-1

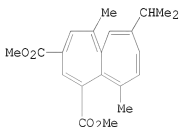
RX(7) RCT F 105048-45-1  
 RGT S 75-77-4 Me3SiCl, T 7681-82-5 NaI  
 PRO R 105048-47-3  
 SOL 75-05-8 MeCN

AN 105:190448 CASREACT

L13 ANSWER 26 OF 29 CASREACT COPYRIGHT 2009 ACS on STN  
 ACCESSION NUMBER: 105:42061 CASREACT  
 TITLE:  $\alpha$ -Skeletal rearrangement of heptalenes: thermal transformation of heptalene-1,2-dicarboxylates into heptalene-1,3-dicarboxylates  
 AUTHOR(S): Bernhard, Werner; Bruegger, Paul; Daly, John J.; Englert, Gerhard; Schoenholzer, Peter; Hansen, Hans Juergen  
 CORPORATE SOURCE: Cent. Res. Units, F. Hoffmann-La Roche and Co., Ltd., Basel, CH-4002, Switz.  
 SOURCE: Helvetica Chimica Acta (1985), 68(4), 1010-24  
 CODEN: HCACAV; ISSN: 0018-019X  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 GI



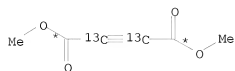
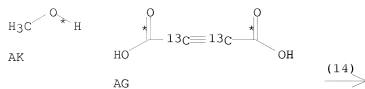
I



II

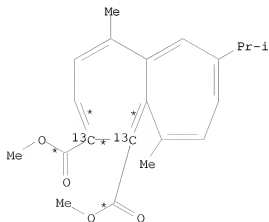
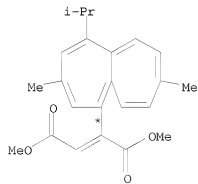
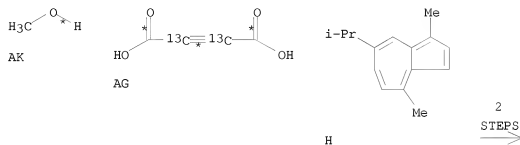
AB Di-Me 1,2-heptalenedicarboxylates rearrange to 1,3-dicarboxylates above 200°. Labeling expts. indicate that the rearrangement of I occurs by interchange of C-2 and C-3 in the heptalene skeleton. Thus, the I  $\rightarrow$  II process is the 1st thermal  $\alpha$ -skeletal rearrangement of heptalenes. X-ray analyses of I and II are discussed.

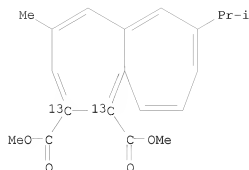
RX(14) OF 39 ...AK + AG ==> AL...



RX(14) RCT AK 67-56-1, AG 101391-58-6  
 RGT T 7664-93-9 H2SO4  
 PRO AL 79519-69-0  
 SOL 7732-18-5 Water, 71-43-2 Benzene

RX(25) OF 39 COMPOSED OF RX(14), RX(15)  
 RX(25) AK + AG + H  $\implies$  AM + AN + AO





AO

RX(14) RCT AK 67-56-1, AG 101391-58-6  
 RGT T 7664-93-9 H2SO4  
 PRO AL 79519-69-0  
 SOL 7732-18-5 Water, 71-43-2 Benzene

RX(15) RCT H 489-84-9, AL 79519-69-0  
 PRO AM 101391-59-7, AN 101391-60-0, AO 101391-61-1  
 SOL 119-64-2 Tetralin  
 AN 105:42061 CASREACT

L13 ANSWER 27 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 104:206693 CASREACT

TITLE: Use of bromine in methanol - preparation of methyl esters

AUTHOR(S): Vairamani, M.; Rao, G. K. Viswanadha  
 CORPORATE SOURCE: Mass Spectrom. Div., Reg. Res. Lab., Hyderabad, 500 007, India

SOURCE: Indian Journal of Chemistry, Section B: Organic Chemistry Including Medicinal Chemistry (1985), 24B(6), 691

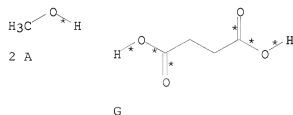
CODEN: IJSBDB; ISSN: 0376-4699

DOCUMENT TYPE: Journal

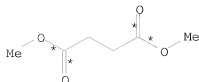
LANGUAGE: English

AB Methyl esters are prepared in 92-98% yield and 95-98% purity when RCO<sub>2</sub>H [R = PhCH<sub>2</sub>, Ph, HO<sub>2</sub>CCH<sub>2</sub>CH<sub>2</sub>, Me(CH<sub>2</sub>)<sub>n</sub>; n = 10, 12, 14] with Br<sub>2</sub> in MeOH. The reaction is light and/or HBr catalyzed. An acid catalyzed mechanism for the reaction is indicated.

RX(3) OF 9 2 A + G ==> H



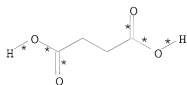
(3) →



H

RX(3) RCT A 67-56-1, G 110-15-6  
 RGT D 7726-95-6 Br2  
 PRO H 106-65-0  
 SOL 67-56-1 MeOH  
 NTE best yield in light

RX(9) OF 9 G + 2 A ==> H

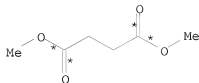


G



2 A

(9)  $\longrightarrow$



H

RX(9) RCT G 110-15-6, A 67-56-1  
 RGT O 10035-10-6 HBr  
 PRO H 106-65-0  
 SOL 67-56-1 MeOH, 7732-18-5 Water  
 AN 104:206693 CASREACT

L13 ANSWER 28 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 103:70927 CASREACT

TITLE: Synthesis of dialkyl esters of succinic acid

AUTHOR(S): Amirkhanyan, M. M.; Elanyan, M. F.

CORPORATE SOURCE: USSR

SOURCE: Trudy IREA (1984), 46, 7-10

CODEN: TKRKAM; ISSN: 0371-876X

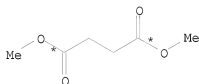
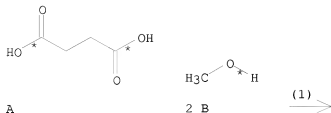
DOCUMENT TYPE: Journal

LANGUAGE: Russian

AB Direct esterification of HO2CCH2CH2CO2H (I) with 4 equiv MeOH and EtOH in 50 mL C6H6 containing 40 g KU-2 + 8 catalyst per mol I at 110° for 10 h and 140° for 6 h, resp., gave 83.2% di-Me and 96.5% di-Et succinate, resp.



RX(1) OF 4      A + 2 B ==> C



C  
YIELD 83%

RX(1)      RCT A 110-15-6, B 67-56-1  
            PRO C 106-65-0  
AN    103:70927 CASREACT

L13 ANSWER 29 OF 29 CASREACT COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 99:52585 CASREACT

TITLE: Reactions of cyclic anhydrides. Part IX. Facile esterification of carboxylic acids with organophosphorus reagents. Novel application of alkylphosphoric esters (APE)

AUTHOR(S): Balasubramanian, V.; Bhatia, V. G.; Wagh, S. B.  
CORPORATE SOURCE: Sci. Res. Cent., H.P.T. Arts and R.Y.K. Sci. Coll., Nasik, 422 005, India

SOURCE: Tetrahedron (1983), 39(9), 1475-85

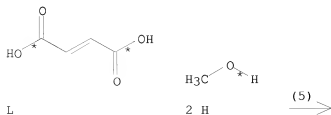
CODEN: TETRAB; ISSN: 0040-4020

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The APE reagent, prepared from P4010 and excess alkanol, was used for the esterification of carboxylic acids (.apprx.50), including maleanilic, fumaranilic, and succinanilic acids.

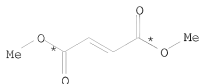
RX(5) OF 73      L + 2 H ==> M



L

2 H

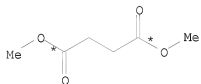
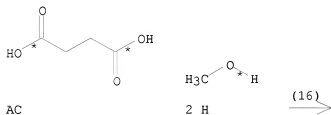
(5) →



M  
YIELD 72%

RX(5)      RCT   L 6915-18-0, H 67-56-1  
             RGT   D 16752-60-6 P4010  
             PRO   M 23055-10-9

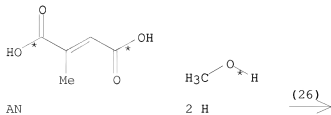
RX(16) OF 73      AC + 2 H ==> AD

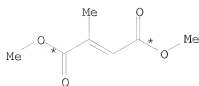


AD  
YIELD 60%

RX(16)      RCT   AC 110-15-6, H 67-56-1  
             RGT   D 16752-60-6 P4010  
             PRO   AD 106-65-0

RX(26) OF 73      AN + 2 H ==> AS

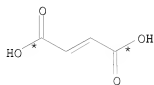




AS  
YIELD 68%

RX(26)      RCT    AN 7407-59-2, H 67-56-1  
              RGT    D 16752-60-6 P4010  
              PRO    AS 84569-14-2

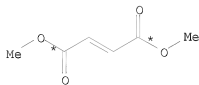
RX(61) OF 73      L + 2 H ==> M



L



(61) →



M  
YIELD 73%

RX(61)      RCT    L 6915-18-0, H 67-56-1  
              RGT    D 16752-60-6 P4010  
              PRO    M 23055-10-9  
AN    99:52585    CASREACT